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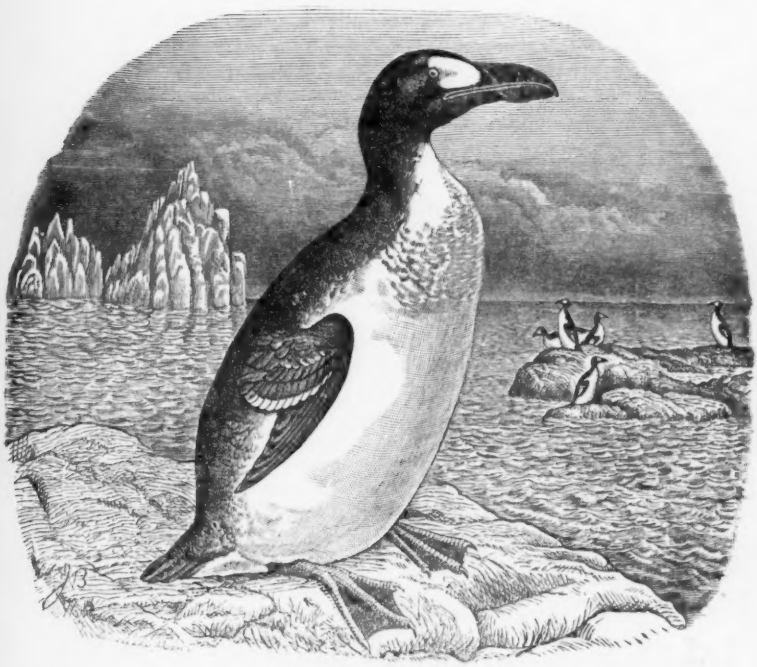
The Auk

A Quarterly Journal of Ornithology

EDITOR
WITMER STONE



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Reichenow, Dr. Anton, Königl. Mus. für Naturkunde, Invalidenstrasse, 43, Berlin.....1891
Salvadori, Prof. Count Tommaso, Royal Zoöl. Museum, Turin....1883
Sclater, Dr. Philip Lutley, Athenæum Club, Pall Mall, London, S. W.....1883
Schalow, Herman, Trauensteinerstrasse 2[1], Berlin, W. 30.....1911
Wallace, Prof. Alfred Russel, Broadstone, Wimborne, Dorset, England.....1883

* Life Fellow.
† Retired Fellow.

CORRESPONDING FELLOWS.

ALFARO ANASTASIO, San José, Costa Rica.....1888
ARRIGONI DEGLI ODDI, Count Dr. E., University of Padua, Italy....1900
BONHOTE, JOHN LEWIS, Gade Spring Lodge, Hemel Hempstead, Herts, England.....1911
BLASIUS, Prof. Dr. WILHELM, Gausstrasse 17, Braunschweig, Germany.1884
BUREAU, Dr. LOUIS, École de Médicine, Nantes, France.....1884
BUTLER, Lieut.-Col. E. A., Winsford Hall, Stokesby, Great Yarmouth, England.....1884
BÜTTIKOFER, Dr. J., Zoölogical Garden, Rotterdam, Holland.....1886
BUTURLIN, SERGIUS A., Wesenberg, Esthonia, Russia.....1907
CAMPBELL, ARCHIBALD JAMES, Melbourne, Australia.....1902
CHAMBERLAIN, MONTAGUE, Cambridge, Mass.....1901
CHUBB, CHARLES, British Museum (Nat. Hist.) Cromwell Road, London, S. W.....1911
CLARKE, WILLIAM EAGLE, Royal Scottish Museum, Edinburgh.....1889
COLLETT, Prof. ROBERT, University Museum, Christiania, Norway...1883
DALGLEISH, JOHN J., Brankston Grange, Bogside Station, Alloa, Scotland.....1883
DOLE, SANFORD B., Honolulu, Hawaiian Islands.....1888
DUBOIS, Dr. ALPHONSE, Museum Natural History, Brussels.....1884
DUGÈS, Prof. ALFREDO, Colegio del Estado, Guanajuato, Mexico....1884
ECHT, ADOLPH BACHOFEN VON, Nussdorf, near Vienna.....1883
EVANS, ARTHUR H., 9 Harvey Road, Cambridge, England.....1899
FEILDEN, Col. H. W., Burwash, Sussex, England.....1884
FERRARI-PEREZ, Prof. FERNANDO, Tacubaya, D. F., Mexico.....1885
FREKE, PERCY EVANS, Southpoint, Limes Road, Folkstone, Kent, England.....1883
FÜRBRINGER, Prof. MAX, Director Anatom. Institute, University of Heidelberg, Heidelberg, Germany.....1891
GADOW, Dr. HANS, University Museum of Zoology, Cambridge, England.....1884
GIRTANNER, Dr. A., St. Galle, Switzerland.....1884
GODWIN-AUSTEN, Lieut.-Col. H. H., Nore, Hascombe, Godalming, Surrey, England.....1884
GOELDI, Prof. Dr. EMIL A., Zieglerstrasse 36, Bern, Switzerland.....1903
GRANDIDIER, ALFRED, 6 Rond-Point des Champs Elysées, Paris.....1883
GURNEY, JOHN HENRY, Keswick Hall, Norwich, England.....1883
HARTING, JAMES EDMUND, Edgewood, Weybridge, Surrey, England..1883
HENNICKE, Dr. CARL R., Gera, Reuss, Germany.....1907
HENSON, HARRY V., Yokohama.....1888
HERMAN, OTTO, Budapest, Hungary.....1908

HUDSON, WILLIAM HENRY, Tower House, St. Luke's Road, Westbourne Park, London, W.....1895
KNUDSON, VALDEMAR, Kauai, Hawaiian Islands.....1888
KRUKENBERG, Dr. E. F. W., Würzburg, Germany.....1884
KRÜPER, Dr. THEOBALD J., University Museum, Athens, Greece....1884
LEGGE, WILLIAM V., Cullenswood House, St. Mary's, Tasmania....1891
LE SOUËF, DUDLEY, Zool. Gardens, Melbourne, Australia.....1911
MACFARLANE, RODERICK, Winnipeg, Manitoba.....1886
MADARÁSZ, Dr. JULIUS VON, National Museum, Budapest, Hungary.1884
MATHEWS, GREGORY M., Langley Mount, Watford, Herts, England..1911
MENZBIER, Dr. M., Imperial Society of Naturalists, Moscow.....1884
MILLAIS, JOHN G., Compton's Brow, Horsham, Sussex, England....1911
NAMIYE, M., Tokio.....1886
NICHOLSON, FRANCIS, The Knoll, Windermere, Westmoreland, England.....1884
NORTH, ALFRED J., Australian Museum, Sydney, New South Wales..1902
OGILVIE-GRANT, WILLIAM R., British Museum (Nat. Hist.), Cromwell Road, London, S. W.....1899
PALMÉN, Dr. J. T., Helsingfors, Finland.....1883
RAMSEY, E. P., Sydney, New South Wales.....1884
RINGER, FREDERIC, Nagasaki.....1888
ROTHSCHILD, Hon. WALTER L., Zoölogical Museum, Tring, England.1898
SCHALOW, HERMAN, Traunsteinerstrasse 2[1], Berlin, W. 30.....1884
SCLATER, WILLIAM LUTLEY, 10 Sloane Court, Chelsea, London, S. W..1906
SUSHKIN Dr. PETER, Imperial University, Moscow.....1903
THEEL, Dr. HJALMAR, University of Upsala, Upsala, Sweden.....1884
TSCHUSI ZU SCHMIDHOFFEN, VICTOR, RITTER VON, Villa Tännenhof, bei Hallein, Salzburg, Austria.....1884
WATERHOUSE, F. H., 3 Hanover Square, London, W.....1889
WINGE, Dr. HERLUF, University Zoölogical Museum, Copenhagen...1903
WORCESTER, Prof. DEAN C., Manila, P. I.....1903
ZELEDON, Don JOSÉ, Costa Rica.....1884

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ALLEN, FRANCIS H., 4 Park St., Boston, Mass.....1901
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ALLISON, ANDREW, Southern Presbyterian Mission, Kiangyui, China.....1902
ATTWATER, H. P., Box 697, Houston, Texas.....1901
BAILEY, VERNON, 1834 Kalorama Ave., Washington, D. C.....1901
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BEEBE, C. WILLIAM, N. Y. Zoölogical Park, New York City.....1903
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BROOKS, ALLAN, Okanagan Landing, B. C.....1909
BOWLES, JOHN HOOPER, Greyson Hotel, Santa Barbara, Cal.....1910
BROWN, HERBERT, Tucson, Arizona.....1901
BRYAN, WILLIAM ALANSON, Pacific Scientific Institution, Honolulu, Hawaiian Islands.....1901
BURNS, FRANK L., Berwyn, Pa.....1901
BUTLER, AMOS W., 52 Downey Ave., Irvington, Indianapolis, Ind...1901
CAMERON, E. S., Marsh, Montana.....1910
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CLARK, AUSTIN HOBART, 1726 18th St., N. W., Washington, D. C...1905
CLARK, Prof. HUBERT LYMAN, Museum of Comparative Zoölogy, Cambridge, Mass.....1902
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DAWSON, WILLIAM LEON, Blaine, Wash.....1905
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FINLEY, WILLIAM L., Box 198, Milwaukee, Ore.....1907
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FORBUSH, EDWARD H., 9 Church St., Westboro, Mass.....1903
FUERTES, LOUIS AGASSIZ, Cornell Heights, Ithaca, N. Y.....1901
GAULT, BENJAMIN TRUE, Glen Ellyn, Ill.....1903
GOLDMAN, EDWARD ALFONSO, Biological Survey, Washington, D. C..1902
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HOWELL, ARTHUR H., 2305 S. Dakota Ave., Washington, D. C.....1902
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JOB, Rev. HERBERT K., 291 Main St., West Haven, Conn.....1901
JORDAN, Prof. DAVID STARR, Stanford University, Cal.....1901
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KNOWLTON, F. H., U. S. Nat. Mus., Washington, D. C.....1902
MCATEE, WALDO LEE, Biological Survey, Washington, D. C.....1910
MACKAY, GEORGE H., 304 Bay State Road, Boston, Mass.....1901
MAILLIARD, JOHN W., 300 Front St., San Francisco, Cal.....1901
MAILLIARD, JOSEPH, 300 Front St., San Francisco, Cal.....1901
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MILLER, WALDRON DEWITT, Amer. Mus. Nat. Hist., New York City.1906
MORRIS, GEORGE SPENCER, Olney, Philadelphia, Pa.....1903
MORRIS, ROBERT O., 72 Temple St., Springfield, Mass.....1904

MURDOCH, JOHN, Public Library, Boston, Mass.....1901
NORTON, ARTHUR H., Mus. Nat. Hist., 22 Elm St., Portland, Maine.1902
PEARSON, T. GILBERT, 1974 Broadway, New York City.....1902
PENNOCK, CHARLES J., Kennett Square, Pa.....1901
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RATHBUN, SAMUEL F., 217 14th Ave., N., Seattle, Wash.....1902
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RILEY, JOSEPH H., U. S. National Museum, Washington, D. C.....1905
RIVES, Dr. WILLIAM C., 1702 Rhode Island Ave., Washington, D. C...1901
ROBINSON, Major WIRT, U. S. A., West Point, N. Y.....1901
SETON, ERNEST THOMPSON, Cos Cob, Conn.....1901
STEPHENS, FRANK, R. F. D. No. 2, San Diego, Cal.....1901
STRONG, Dr. REUBEN M., Dept. Zoöl., Univ. of Chicago, Chicago, Ill.1903
SWALES, BRADSHAW HALL, Grosse Isle, Mich.....1909
SWARTH, HARRY S., University of California, Berkeley, Cal.....1909
TAVERNER, PERCY A., Victoria Memorial Museum, Ottawa, Canada..1909
THAYER, ABBOTT H., Monadnock, N. H.....1901
THAYER, JOHN ELIOT, Lancaster, Mass.....1905
TODD, W. E. CLYDE, Carnegie Museum, Pittsburgh, Pa.....1901
TORREY, BRADFORD, Hotel Upham, Santa Barbara, Cal.....1901
TOWNSEND, CHARLES H., Aquarium, Battery Park, New York City.1901
TOWNSEND, Dr. CHARLES WENDELL, 76 Marlborough St., Boston, Mass.....1905
TROTTER, Dr. SPENCER, Swarthmore College, Swarthmore, Pa.....1901
WARREN, EDWARD ROYAL, 20 West Caramillo St., Colorado Springs, Colo.....1910
WAYNE, ARTHUR T., Mt. Pleasant, S. C.....1906
WOLCOTT, Dr. ROBERT H., Univ. of Nebraska, Lincoln, Neb.....1903
WRIGHT, Mrs. MABEL OSGOOD, Fairfield, Conn.....1901

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ABBOTT, CLINTON GILBERT, 153 W. 73rd St., New York City.....1898
ADAMS, BENJAMIN, 476 5th Ave., New York City.....1911
ADAMS, WALLACE, Los Angeles, Cal.....1901
ADAMS, Dr. Z. B., 416 Marlborough St., Boston, Mass.....1908
AIKEN, CHARLES EDWARD HOWARD, 12 Pikes Peak Ave., Colorado Springs, Colo.....1898
AIKEN, Hon. JOHN, Orchard St., Greenfield, Mass.....1905
ALEXANDER, Miss ANNIE M., Sea View & Union Aves., Piedmont, Cal.1911
ALLEN, ARTHUR A., 115 Stewart Ave., Ithaca, N. Y.....1909
ALLISON, HENRY, 37 Prospect St., Fitchburg, Mass.....1909
ALLISON, WILLIAM B., 7916 Plum St., New Orleans, La.....1905
ANDERSON, Mrs. J. C., Englewood, N. J.....1903

ANDERSON, Dr. RUDOLPH M., Am. Mus. Nat. History, N. Y. City....1907
ANDREWS, ROY C., Amer. Mus. Nat. Hist., New York City.....1906
ANGELL, WALTER A., 33 Westminster St., Providence, R. I.....1901
ANTHONY, H. E., Amer. Mus. Nat Hist., New York City.....1911
ARCHBOLD, JOSEPH A., 107 Hodge Ave., Buffalo, N. Y.....1903
ARMSTRONG, EDWARD E., 3253 Humboldt Ave., Chicago, Ill.....1904
ARNOLD, EDWARD, Grand Trunk R'y., Montreal, Quebec.....1894
ARNOLD, F. E., 284 Pleasant St., East Providence, R. I.....1909
ARNOLD, Dr. W. W., 504 N. Nevada Ave., Colorado Springs, Colo...1910
ARNOW, ISAAC F., St. Marys, Ga.....1903
AVIS, EDWARD, Box 56, Enfield, Conn.....1908
BABCOCK, DEAN, Estes Park, Colo.....1911
BABSON, W. A., South Orange, N. J.....1901
BAGG, EGBERT, 424 Genesee St., Utica, N. Y.....1883
BAILEY, Prof. G. A., Geneseo, N. Y.....1910
BAILEY, HAROLD H., Box 154, Newport News, Va.....1903
BAILEY, SAMUEL WALDO, Box 212, Newburyport, Mass.....1909
BAIRD, Miss LUCY HUNTER, 341 S. 18th St., Philadelphia, Pa.....1899
BAKER, FRANK C., Chicago Acad. Sciences, Chicago, Ill.....1907
BAKER, JOHN H., 11 Wadsworth House, Cambridge, Mass.....1911
BALDWIN, ROGER N., 3739 Windsor Place, St. Louis, Mo.....1904
BALES, Dr. BLENN R., 149 N. Main St., Circleville, Ohio.....1907
BALL, Mrs. BENNET F., Oakville, Conn.....1905
BALL, Miss HELEN AUGUSTA, 43 Laurel St., Worcester, Mass.....1893
BALL, JOS. P., 4445 Frankford Ave., Philadelphia, Pa.....1911
BANKS, Miss MARTHA, Westport, Conn.....1911
BARBOUR, Rev. ROBERT, Y. M. C. A., Montclair, N. J.....1902
BARBOUR, THOMAS, Mus. of Comp. Zoölogy, Cambridge, Mass.....1903
BARNARD, Judge JOB, 1306 Rhode Island Ave., Washington, D. C.....1886
BARNES, CLAUDE T., Box 1199, Salt Lake City, Utah.....1908
BARNES, Hon. R. MAGOON, Lacon, Ill.....1889
BARRETT, HAROLD LAWRENCE, 704 Centre St., Jamaica Plain, Mass...1909
BARRY, Miss ANNA K., 5 Bowdoin Ave., Dorchester, Mass.....1907
BATTEN, GEORGE, 93 Union St., Montclair, N.J.....1911
BAYNARD, OSCAR E., Fort Myers, Fla.....1910
BECK, ROLLO HOWARD, Berryessa, Cal.....1894
BEERS, HENRY W., 91 Denver Ave., Bridgeport, Conn.....1895
BENNER, FRANKLIN, 1960 Kenwood Parkway, Minneapolis, Minn...1909
BENNETTS, WILLIAM J., 1941 1st St. N. W., Washington, D. C.....1901
BERGTOLD, Dr. W. H., 1159 Race St., Denver, Colo.....1889
BERIER, DE LAGNEL, 145 Buena Vista Place, Ridgewood, N. J.....1885
BERRY, Mrs. S. JENNIE, 633 Waterloo St., London, Ontario.....1909
BETTS, NORMAN DE WITT, Forest Service, Boulder, Colo.....1908
BIDDLE, Miss EMILY WILLIAMS, 2201 Sansom St., Philadelphia, Pa..1898
BIGELOW, ALBERT F., 84 State St., Boston, Mass.....1910
BIGELOW, HENRY BRYANT, Concord, Mass.....1897

BIGELOW, HOMER LANE, Old Orchard Road, Chestnut Hill, Mass....1902
BIGNELL, Mrs. EFFIE, New Brunswick, N. J.....1911
BIRDSEYE, CLARENCE, Biological Survey, Washington, D. C.....1908
BLACKWELDER, ELIOT, Univ. of Wisconsin, Madison, Wis.....1895
BLAIN, Dr. ALEX. W., Jr., 1105 Jefferson Ave., E., Detroit, Mich...1901
BLAIN, MERRILL W., 1321 Glendale Ave., Tropico, Cal.....1910
BLAKE, MAURICE C., Magdalen College, Oxford, England.....1907
BLAKE, SIDNEY F., 38 Walnut St., Stoughton, Mass.....1910
BLATCHLEY, W. S., 1530 Park Ave., Indianopolis, Ind.....1895
BLOOMFIELD, Mrs. C. C., 723 Main St., W., Jackson, Mich.....1901
BOARDMAN, Miss E. D., 416 Marlborough St., Boston, Mass.....1906
BOGARDUS, Miss CHARLOTTE, Elm St., Coxsackie, N. Y.....1909
BOGERT, WILLIAM S., Box 53, Leonia, N. J.....1904
BOHLMAN, HERMAN T., 202 Occident St., Portland, Ore.....1901
BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo...1909
BOND, HARRY L., Lakefield, Minn.....1908
BOOTH, SHERMAN M., Glen Cove, Ill.....1911
BORLAND, WM. G., 17 Broad St., New York City.....1911
BOSSON, CAMPBELL, 722 Tremont Bldg., Boston, Mass.....1906
BOUDINOT, Mrs. H. R., 302 Rusholme St., Davenport, Iowa.....1909
BOWDISH, B. S., Demarest, N. J.....1891
BOWDISH, Mrs. B. S., Demarest, N. J.....1902
BOWDITCH, HAROLD, Mass. General Hospital, Boston, Mass.....1900
BRACKEN, Mrs. HENRY MARTYN, 1010 Fourth St., S. E., Minneapolis, Minn.....1897
BRADFORD, MOSES B. L., Concord Public Library, Concord, Mass.....1889
BRADLEE, THOMAS STEVENSON, Somerset Club, Boston, Mass.....1902
BRANDRETH, COURTENAY, Cliff Cottage, Ossining, N. Y.....1905
BRANDRETH, FRANKLIN, Cliff Cottage, Ossining, N. Y.....1889
BREWSTER, EDWARD EVERETT, 316 East C St., Iron Mountain, Mich.1893
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.....1910
BRIDGE, Mrs. EDMUND, 52 Wyman St., West Medford, Mass.....1902
BRIGHT, Miss ANNA L., Pottsville, Pa.....1903
BRIMLEY, H. H., Raleigh, N. C.....1904
BRISTOL, JOHN I. D., 45 West 74th St., New York City.....1907
BROCK, Dr. HENRY HERBERT, 687 Congress St., Portland, Me.....1894
BROOKS, WINTHROP S., Milton, Mass.....1907
BROOKS, Rev. EARLE AMOS, Weston, W. Va.....1892
BROWN, Miss ANNIE H., 31 Maple St., Stoneham, Mass.....1909
BROWN, ARTHUR L., 217 Spring St., West Roxbury, Mass.....1908
BROWN, C. EMERSON, Boston Society Natural History, Boston, Mass.1908
BROWN, EDWARD J., U. S. Nat. Museum, Washington, D. C.....1891
BROWN, HUBERT H., Beamsville, Ontario.....1889
BROWN, PHILLIP G., 85 Vaughan St., Portland, Me 1911
BROWN, STEWARDSON, 20 E. Penn. St., Germantown, Philadelphia, Pa.1895
BROWN, WM. JAMES, 250 Olive Ave., Westmount, Quebec.....1908

BROWNING, WM. HULL, 16 Cooper Square, New York City.....1911
BRUEN, FRANK, 65 Prospect St., Bristol, Conn.....1908
BUBIER, GEO. M., 185 Franklin St., Lynn, Mass.....1911
BURGESS, JOHN KINGSBURY, Chestnut St., Dedham, Mass.....1898
BURKE, WM. BARDWELL, 130 Spring St., Rochester, N. Y.....1901
BURNETT, WILLIAM L., Fort Collins, Colo.....1895
BURT, H. P., 355 Union St., New Bedford, Mass.....1908
BURTCH, VERDI, Branchport, N. Y.....1903
BUTLER, Miss CHARLOTTE W., 500 Audubon Road, Boston, Mass...1904
BUXBAUM, Mrs. CLARA E., St. Joseph, Mich.....1895
CABOT, LOUIS, Brookline, Mass.....1904
CADUC, Eugene E., 563 Massachusetts Ave., Boston, Mass.....1910
CALLENDER, JAMES PHILLIPS, 603 Springfield Ave., Summit, N. J...1903
CARPENTER, Rev. CHARLES KNAPP, 311 Park St., Elgin, Ill.....1894
CARPENTER, GEORGE I., 696 Halsey St., Brooklyn, N. Y.....1907
CARRIKER, M. A., Jr., Santa Marta, Colombia.....1907
CARTER, JOHN D., Lansdowne, Pa.....1907
CASE, CLIFFORD M., 7 Holcomb St., Hartford, Conn.....1892
CASH, HARRY A., 54 Spring St., Pawtucket, R. I.....1898
CASKEY, ROBERT C., 58 Mills St., Morristown, N. J.....1908
CATLIN, JAMES P., Ottawa, Ill.....1905
CHAMBERLAIN, CHAUNCY W., 36 Lincoln St., Boston, Mass.....1885
CHAMBERS, W. LEE, "The Condor," Los Angeles, Cal.....1907
CHAPIN, Prof. ANGIE CLARA, 25 Freeman Cottage, Wellesley, Mass...1896
CHAPIN, JAMES, 330 W. 95th St., New York City.....1906
CHAPMAN, Mrs. F. M., Englewood, N. J.....1908
CHAPMAN, ROY, 507 15th Ave., S. E., Minneapolis, Minn.....1911
CHASE, SIDNEY, 346 Beacon St., Boston, Mass.....1904
CHEESMAN, M. R., 75 W. 4th St., S., Salt Lake City, Utah.....1911
CHRISTIE, EDWARD H., 5069 Kensington Ave., St. Louis, Mo.....1910
CHRISTY, BAYARD H., 403 Frederick Ave., Sewickley, Pa.....1901
CLARK, B. PRESTON, Box 2862, Boston, Mass.....1907
CLARK, EDWARD B., Hamilton Hotel, Washington, D. C.....1900
CLARK, JOSIAH H., 238 Broadway, Paterson, N. J.....1895
CLARKE, Mrs. ARTHUR E., Staupe Place, Manchester, N. H.....1909
CLARKE, CHARLES E., 11 Chetwynd Road, West Somerville, Mass...1907
CLARKE, Miss HARRIET E., 9 Chestnut St., Worcester, Mass.....1896
CLARKE, ROWENA A., Kirkwood Station, St. Louis, Mo.....1906
CLARKE, Dr. WM. C., 200 W. 56th St., New York City.....1909
CLAY, CHAS. IRVIN, Box 353, Eureka, Cal.....1911
CLEAVES, HOWARD H., Princes Bay, Staten Island, N. Y.....1907
CLEVELAND, Miss LILIAN, Woods Edge Road, West Medford, Mass..1906
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CLEVELAND, WM. BINGHAM, Burton, Ohio.....1909
COALE, HENRY K., Highland Park, Ill.....1883
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COBB, STANLEY, 340 Adams St., Milton, Mass.....1909
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COPELAND, MANTON, 88 Federal St., Brunswick, Me.....1900
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COX, ULYSSES O., State Normal School, Terre Haute, Ind.....1894
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CRAM, R. J., 26 Hancock Ave., W., Detroit, Mich.....1893
CRANDALL, C. W., 10 Third St., Woodside, N. Y.....1891
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CRANE, Miss CLARA L., Dalton, Mass.....1904
CRANE, Mrs. ZENAS, Dalton, Mass.....1904
CROMWELL, JAMES W., Box 246, Summit, N. J.....1904
CROSBY, MAUNSELL S., Grasmere, Rhinebeck, N. Y.....1904
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CURRIE, ROLLA P., Dept. of Agriculture, Washington, D. C.....1895
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DAVIS, HENRY C., Cummaquid, Mass.....1909
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DELOACH, R. J. H., University of Ga., Athens, Ga.....1910
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DIMICK, CHAS. W., 1008 Tremont Bldg., Boston, Mass.....1909
DIMOCK, GEO. E., Jr., 907 N. Broad St., Elizabeth, N. J.....1911
DIONNE, C. E., Laval University, Quebec, Que.....1893
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DODGE, CHARLES W., Univ. of Rochester, Rochester, N. Y.....1900
DODSON, JOSEPH H., 534 Sheridan Road, Evanston, Ill.....1909
DOUGHERTY, Gen. WILLIAM E., 1409 E. 14th St., Fruitvale, Cal.....1890
DRAPER, J. SUMNER, Readville, Mass.....1908
DROWNE, Dr. FREDERICK PEABODY, Chilesburg, Va.....1899
DRUMMOND, Miss MARY, Spring Lane, Lake Forest, Ill.....1904
DUBOIS, ALEX. DAWES, 320 Waldron St., West La Fayette, Ind.....1905
DU BON, JAMES L., Windsor Locks, Conn.....1909
DUGMORE, ARTHUR RADCLYFFE, Newfoundland, N. J.....1899
DULL, Mrs. A. P. L., 211 N. Front St., Harrisburg, Pa.....1900
DUNBAR, W. LINFRED, Union Metallic Cartridge Co., Bridgeport, Conn.....1906
DUNHAM, ARTHUR LOUIS, 49 Hampden Hall, Cambridge, Mass.....1910
DUNN, Miss HARRIET A., Box 45, Athol, Mass.....1909
DURFEE, OWEN, Box 125, Fall River, Mass.....1887
DUYREA, Miss ANNIE B., 62 Washington St., Newark, N. J.....1911
DWIGHT, Dr. EDWIN W., 119 Pearl St., Boston, Mass.....1911
DYCHE, Prof. L. L., Pratt, Kansas.....1886
DYER, ED. T., Southampton, N. Y.....1911
DYKE, ARTHUR CURTIS, Bridgewater, Mass.....1902
EARLE, Miss ELEANOR P., Palma Sola, Fla.....1910
EASTMAN, FRANCIS B., Delaware College, Newark, Del.....1909
EASTMAN, HARRY D., Framingham, Mass.....1891
EATON, Miss MARY S., 8 Monument St., Concord, Mass.....1909
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....1886
EHINGER, Dr. CLYDE E., 100 Rosedale Ave., West Chester, Pa.....1904
EICHE, AUGUST, 1133 O St., Lincoln, Neb.....1902
EIFRIG, Rev. C. W. GUSTAVE, Addison, Ill.....1901
EIMBECK, Dr. A. F., New Haven, Mo.....1906
EKBLAW, WALTER ELMER, Nat. Hist. Bldg., 809 West Main St., Urbana, Ill.....1911
ELLS, GEORGE P., Norwalk, Conn.....1904
ELROD, Prof. MORTON J., 205 S. 5th St., Missoula, Montana.....1892
EMBODY, GEORGE CHARLES, 324 College Ave., Ithaca, N. Y.....1898
EMMET, CHRISTOPHER TEMPLE, Stony Brook, N. Y.....1909
EMMET, ROBERT T., New Rochelle, N. Y.....1904

EMORY, Mrs. MARY DILLE, 156 Foundry St., Morgantown, W. Va...1899
ELLIOTT, Dr. E. EARL, 63 William St., Lyons, N. Y.....1909
ENDERS, JOHN O., Box 546, Hartford, Conn.....1904
ESSICK, WM. S., Box 858, Reading, Pa.....1906
EUSTIS, RICHARD S., 17 Highland St., Cambridge, Mass.....1903
EVANS, Miss NEVADA, 3637 10th Ave., S., Minneapolis, Minn.....1910
EVANS, WILLIAM B., 205 E. Central Ave., Moorestown, N. J.....1897
FARLEY, JOHN A., 105 Summer St., Malden, Mass.....1904
FARR, MARCUS S., Princeton University, Princeton, N. J.....1900
FARWELL, Mrs. JOHN V., Ardleigh, Lake Forest, Ill.....1896
FAY, L. H., Brocton, N. Y.....1910
FAY, S. PRESCOTT, 3 Brimmer St., Boston, Mass.....1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo.....1898
FELL, Miss EMMA TREGO, 28 N. 39th St., West Philadelphia, Pa.....1903
FELTON, W. R., Box 414, Miles City, Mont.....1910
FIELD, EDWARD B., 30 Gillette St., Hartford, Conn.....1898
FIELD, Dr. GEO. W., Sharon, Mass.....1910
FISHER, Miss ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa..1896
FISHER, G. CLYDE, Johns Hopkins Univ., Baltimore, Md.....1908
FISHER, WALTER T., 52 Plympton St., Cambridge, Mass.....1907
FITTS, Mrs. CAROLINE M., 29 Lakeville Place, Jamaica Plain, Mass..1906
FLANAGAN, JOHN H., 392 Benefit St., Providence, R. I.....1898
FLETCHER, Mrs. MARY E., Proctorsville, Vt.....1898
FOOTE, Miss F. HUBERTA, 90 Locust Hill Ave., Yonkers, N. Y.....1897
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.....1901
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Cal.....1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.....1898
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.....1883
FRANCIS, GEO. A., 1453 Sea View Ave., Bridgeport, Conn.....1911
FRASER, DONALD, Johnstown, N. Y.....1902
FRAZIER, J. F., Audubon, Iowa.....1909
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.....1903
FREEMAN, Dr. LEONARD, 1374 Elizabeth St., Denver, Colo.....1909
FRENCH, CHARLES H., Canton, Mass.....1904
FRENCH, Mrs. TERESA I., Canton, Mass.....1908
FUGUET, DALLETT, 229 Upper Mountain Ave., Montclair, N. J.....1911
FULLER, CLARENCE J., Elmwood Ave., Bayside, N. Y.....1907
FULLER, Mrs. ELLA M., Needham, Mass.....1909
FULLER, T. OTIS, Needham, Mass.....1904
FUTCHER, Dr. THOMAS B., 23 W. Franklin St., Baltimore, Md.....1906
GANO, Miss LAURA, 744 National Road, W., Richmond, Ind.....1903
GARDINER, CHARLES BARNES, 5 Minard Place, Norwalk, Ohio.....1903
GARRICK, JAMES P., Jr., Weston, S. C.....1906
GATH, JOHN, Box 236, Torrington, Conn.....1901
GIBSON, LANGDON, 5 Union St., Schenectady, N. Y.....1904
GIFFORD, EDWARD WINSLOW, Cal. Acad. Sci., San Francisco, Cal.....1904

GILMAN, M. FRENCH, Sacaton, Arizona....1907
GIANINI, CHAS. A., Poland, N. Y....1911
GOODALE, Dr. JOSEPH LINCOLN, 258 Beacon St., Boston, Mass....1885
GOODELL, Mrs. JAMES P., Rhinebeck, N. Y....1909
GOODRICH, JULIET T., 1210 Astor St., Chicago, Ill....1904
GOODWIN, Miss AMELIA M., 10 Follen St., Cambridge, Mass....1904
GORDON, HARRY E., 313 Laburnum Ave., Rochester, N. Y....1911
GOULD, JOSEPH E., 5 Clifton St., Norfolk, Va....1889
GRAHAM, WM. J., Aledo, Ill....1909
GRANGER, Miss HELEN, Wilder Hall, Amherst, Mass....1904
GRANGER, WALTER, Amer. Mus. Nat. Hist., New York City....1891
GRANT, WM. W., Englewood, N. J....1910
GRAVES, Mrs. CHARLES B., 66 Franklin St., New London, Conn....1905
GREEN, Miss MARY AMORY, Croton-on-Hudson, N. Y....1911
GREENOUGH, HENRY VOSE, 23 Monmouth Court, Brookline, Mass....1901
GREGORY, STEPHEN S., Jr., 1349 Astor St., Chicago, Ill....1906
GRISCOM, LUDLOW, 21 Washington Sq., N., New York City....1908
GRONBERGER, S. M., Smithsonian Inst., Washington, D. C....1909
GROSS, ALFRED O., 391 Hyde Park Ave., Roslindale, Boston, Mass....1907
GUTSELL, JAMES S., Ithaca, N. Y....1911
HADLEY, ALDEN H., Monrovia, Indiana....1906
HALES, HENRY, Ridgewood, N. J....1890
HALL, FRANK H., Agricultural Experiment Station, Geneva, N. Y....1910
HALL, H. PORTER, Leominster, Mass....1904
HALLETT, GEO. H., Jr., 105 E. Essex Ave., Lansdowne, Pa....1911
HAMILTON, Dr. B. A., Highland Park, Ill....1909
HANKINSON, THOS. LEROY, Charleston, Ill....1897
HARDON, Mrs. HENRY W., 315 West 71st St., New York City....1905
HARDY, JOHN H., Jr., Littleton, Mass....1905
HARPER, FRANCIS, 557 First Ave., College Point, N. Y....1907
HARPER, Mrs. MARY McC., 102 Pennsylvania Ave., Wilmington, Del.1910
HARRIS, HARRY, Kansas City, Mo....1911
HARRIS, ROY C., 725 N. 10th St., Richmond, Ind....1911
HART, CHARLES G., Box 47, East Berlin, Conn....1908
HARVEY, Miss RUTH SAWYER, Bond Hill, Cincinnati, Ohio....1902
HASKELL, Miss HELEN P., 1207 Henry St., Alton, Ill....1905
HATHAWAY, HARRY S., Box 1466, Providence, R. I....1897
HAVEMEYER, H. O., Jr., 129 Front St., New York City....1893
HAZARD, Hon. R. G., Peace Dale, R. I....1885
HEIL, CHARLES E., Needham, Mass....1908
HELME, ARTHUR H., Miller Place, N. Y....1888
HENDERSON, Judge JUNIUS, Boulder, Colo....1903
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y....1885
HENN, ARTHUR WILBUR, Indiana University, Bloomington, Ind....1909
HENNINGER, Rev. WALTHER F., New Bremen, Ohio....1898
HERRICK, HAROLD, 25 Liberty St., New York City....1905

HERSEY, L. J., 2121 W. 34th Ave., Denver, Colo.....1909
HERSEY, F. SEYMOUR, 6 Maple Ave., Taunton, Mass.....1911
HESS, ISAAC E., Philo, Ill.....1909
HIGBEE, HARRY G., 13 Austin St., Hyde Park, Mass.....1900
HILL, JAMES HAYNES, Box 485, New London, Conn.....1897
HILL, Mrs. THOMAS R., 4629 Baltimore Ave., Philadelphia, Pa.....1903
HINE, ASHLEY, 615 Isabella St., Edmonton, Alberta.....1909
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio....1899
HINE, Mrs. JANE L., Auburn, Ind.....1890
HITCHCOCK, FRANK H., Metropolitan Club, Washington, D. C.....1891
HIX, GEORGE E., 630 Columbus Ave., New York City.....1904
HODGE, Prof. CLIFTON FREMONT, Clark Univ., Worcester, Mass.....1899
HOLDEN, Mrs. EMELINE R., 13 E. 79th St., New York City.....1902
HOLDEN, Mrs. EDWIN B., 323 Riverside Drive, New York City.....1903
HOLLAND, HAROLD MAY, 5322 Ellis Ave., Chicago, Ill.....1910
HOLLAND, Dr. WILLIAM J., Carnegie Institute, Pittsburgh, Pa.....1899
HOLLISTER, WARREN D., 620 McPhea Bld'g., Denver, Colo.....1901
HOLMAN, RALPH H., 33 Chestnut St., Stoneham, Mass.....1907
HOLT, ERNEST F., Barachias, Ala.....1911
HOLT, Mrs. NANCY W. C., 136 Chauncey St., Cambridge, Mass.....1908
HONYWILL, ALBERT W., Jr., 171 Ellsworth Ave., New Haven, Conn..1907
HORSFALL, BRUCE, Princeton, N. J.....1905
HOWELL, A. BRAZIER, 250 N. Orange Grove Ave., Pasadena, Cal...1909
HOWELL, BENJAMIN F., Jr., R. F. D. 1, Boonton, N. J.....1907
HOWE, CARLTON D., Essex Junction, Vt.....1901
HOWE, Miss LOUISE, 53 Linden St., Brookline, Mass.....1908
HOWE, REGINALD HEBER, Jr., Middlesex School, Concord, Mass...1895
HOXIE, WALTER J., 1522 Bull St., Savannah, Ga.....1909
HOYT, Miss ANNIE S., 121 Madison Ave., New York City.....1909
HOYT, WILLIAM H., Box 425, Stamford, Conn.....1907
HUBBARD, Dr. LUCIUS L., Houghton, Mich.....1907
HUBBARD, Mrs. SARA A., 177 Woodruff Ave., Brooklyn, N. Y.....1891
HUDSON, Mrs. R. W., 373 Broadway, Cambridge, Mass.....1911
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.....1895
HUNT, CHRESWELL J., 740 S. Cuyler Ave., Oak Park, Ill.....1902
HUTCHINSON, Dr. W. F., Box 42, Portsmouth, Va.....1910
INGALLS, CHARLES E., East Templeton, Mass.....1885
INGERSOLL, ALBERT M., Box 843, San Diego, Cal.....1885
IRVING, JOHN, 52 Broadway, Glen Cove, N. Y.....1894
ISHAM, C. B., 30 E. 63d St., New York City.....1891
JACKSON, HARTLEY H. T., Biological Survey, Washington, D. C.....1910
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.....1888
JAMES, Mrs. I. M., 105 W. Court St., Doylestown, Pa.....1909
JENNEY, CHARLES F., 100 Gordon Ave., Hyde Park, Mass.....1905
JESSUP, J. M., Smithsonian Institution, Washington, D. C.....1910
JEWEL, LINDSEY L., Gatun, Canal Zone, Panama.....1910

JEWETT, STANLEY G., 582 Bidwell Ave., Portland, Oregon.....1906
JEWETT, MCCORMICK, 205 Yale Station, New Haven, Conn.....1909
JOHNS, ERWIN WM., Kingsley, Arizona.....1910
JOHNSON, Mrs. GRACE PETTIS, City Library Association, Springfield, Mass.....1908
JOHNSON, FRANK EDGAR, 16 Amackassin Terrace, Yonkers, N. Y.....1888
JOHNSON, JAMES HOWARD, Bradford, N. H.....1894
JOHNSON, WALTER ADAMS, 18 Gramercy Park, New York City.....1889
JOHNSON, WILLIAM S., Lyons, N. Y.....1893
JOHNSTON, J. W., 5 Arnold Park, Rochester, N. Y 1911
JORDAN, A. H. B., Lowell, Wash.....1888
JUDD, ELMER T., Cando, N. D.....1895
JUMP, Mrs. EDWIN R., 350 Waltham St., West Newton, Mass.....1910
KALMBACH, EDWIN R., Biological Survey, Washington, D. C.....1910
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario.....1899
KEIM, THOMAS DANIEL, 405 Radcliffe St., Bristol, Pa.....1902
KENDALL, H. T , Virginia, Minn.....1911
KENNARD, FREDERIC HEDGE, Dudley Road, Newton Centre, Mass...1892
KENT, EDWIN C., 90 West St., New York City.....1907
KERMODE, FRANCIS, Provincial Museum, Victoria B. C.....1904
KEYES, Prof. CHAS. R., Mt. Vernon, Ia.....1904
*KIDDER, NATHANIEL T., Milton, Mass.....1906
KILBURN, FRANK M., 214 Stewart Ave., Ithaca, N. Y.....1911
KILGORE, WILLIAM, Jr., 1705 4th Ave., S., Minneapolis, Minn.....1906
KILMAN, A. H., Ridgeway, Ontario.....1909
KING, LE ROY, 20 E. 84th St., New York City.....1901
KIRKHAM, Mrs. JAMES W., 275 Maple St., Springfield, Mass.....1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.....1910
KIRKWOOD, FRANK C., Long Green, Md.....1892
KITTREDGE, JOSEPH, Jr., 67 Cypress St., Brookline, Mass.....1910
KLOSEMAN, Miss JESSIE E., 4 Spruce St., Dedham, Mass.....1909
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.....1906
KNAPP, Mrs. HENRY A., 301 Quincy Ave., Scranton, Pa.....1907
KNOLHOFF, FERDINAND WILLIAM, Bloomfield, N. J.....1890
KOHLER, LOUIS SLIDELL, 98 Watsessing Ave., Bloomfield, N. J.....1910
KREMER, ROLAND EDWARD, 1720 Vilas St., Madison, Wis.....1909
KUSER, ANTHONY R., Bernardsville, N. J.....1908
KUSER, Mrs. ANTHONY R., Faircourt, Bernardsville, N. J.....1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.....1910
KUTCHIN, Dr. VICTOR, Green Lake, Wis.....1905
LACEY, HOWARD GEORGE, Kerrville, Texas.....1899
LANCASHIRE, Mrs. JAMES HENRY, Alma, Mich.....1909
LANE, LAWTON W., 121 Franklin St., Lynn, Mass.....1909
LANG, HERBERT, Amer. Mus. Nat. Hist., New York City.....1907

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LANTZ, Prof. DAVID ERNEST, Dept. of Agriculture, Washington, D. C.1885
LARRABEE, AUSTIN P., 1540 Vassar Ave., Wichita, Kan.....1902
LATIMER, Miss CAROLINE P., 19 Pierrepont St., Brooklyn, N. Y.....1898
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa...1902
LAW, J. EUGENE, Hollywood, Cal.....1907
LAWRENCE, JOHN B., 126 E. 30th St., New York City.....1907
LEE, HENRY E., Rapid City, S. D.....1910
LEVEY, W. CHARLESWORTH, 53 Waverly St., Brookline, Mass.....1908
LEWIS, Dr. FREDERIC T., Harvard Medical School, Boston, Mass.....1909
LINCOLN, FREDERICK CHARLES, 3350 Shoshone St., Denver, Colo.....1910
LINTON, CLARENCE B., 125 West Ocean Ave., Long Beach, Cal.....1908
LOOMIS, JOHN A., Mereta, Texas.....1887
LORD, Rev. WILLIAM R., Dover, Mass.....1901
LORING, J. ALDEN, Owego, N. Y.....1889
LOW, ETHELBERT T., 30 Broad St., New York City.....1907
LUM, EDWARD H., Chatham, N. J.....1904
LUTHER, CLARENCE H., 8 McIlley Bldg., Fayetteville, Ark.....1910
MACDOUGALL, GEORGE R., 112 Wall St., New York City.....1890
MACKIE, WM. C., 54 Coolidge St., Brookline, Mass.....1908
MACLAY, MARK W., Jr., 70 West 55th St., New York City.....1905
MADDOCK, Miss EMELINE, The Belgravia, Philadelphia, Pa.....1897
MAHER, J. E., Windsor Locks, Conn.....1902
MAITLAND, ROBERT L., 141 Broadway, New York City.....1889
MARBLE, RICHARD M., 7 Keiffer St., Brookline, Mass.....1907
MARCH, Prof. JOHN LEWIS, Union College, Schenectady, N. Y.....1903
MARRS, Mrs. KINGSMILL, Saxonville, Mass.....1903
MARSDEN, H. W., Witch Creek, Cal.....1904
MARTIN, Miss MARIA ROSS, Box 365, New Brunswick, N. J.....1902
MARX, EDWARD J. F., 8 Chestnut Terrace, Easton, Pa.....1907
MAULE, GEO. C., Gum Tree, Pa.....1910
MCCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.....1900
MCCONNELL, HARRY B., 142 E. Warren St., Cadiz, O.....1904
MCCOOK, PHILIP JAMES, 15 William St., New York City.....1895
MCHATTON, Dr. HENRY, Macon, Ga.....1898
MCILHENNY, EDWARD AVERY, Avery Island, La.....1894
MCINTIRE, Mrs. HERBERT BRUCE, 4 Garden St., Cambridge, Mass...1908
MCLAIN, ROBERT BAIRD, Market and 12th Sts., Wheeling, W. Va....1893
MCMILLAN, Mrs. GILBERT, 1 Mercer Circle, Cambridge, Mass.....1902
MEAD, Mrs. E. M., 2465 Broadway, New York City.....1904
MERRIAM, CHARLES, Weston, Mass.....1908
MERRIAM, HENRY F., 94 New England Ave., Summit, N. J.....1905
MERRILL, HARRY, Bangor, Maine.....1883
MERSHON, W. B., Saginaw, Mich.....1905
MESSENGER, G. H., Linden, Iowa.....1911
METCALF, WILLARD L., 33 West 67th St., New York City.....1908
MILLER, CHAS. W., Shawnee-on-Delaware, Pa.....1909

MILLS, HARRY C., Box 218, Unionville, Conn.....1897
MILLS, HERBERT R., Jacksonville, Fla.....1911
MILLS, Prof. WILLIAM C., Ohio State Univ., Columbus, O.....1900
MITCHELL, CATHERINE ADAMS, Riverside, Ill.....1911
MITCHELL, Dr. WALTON I., 603 Beacon Bldg., Wichita, Kan.....1893
MOORE, HENRY D., Haddenfield, N. J.....1911
MOORE, Miss ELIZ. PUTNAM, 70 West 11th St., New York City.....1905
MOORE, ROBERT THOMAS, 46 Mansion Ave., Haddonfield, N. J.....1898
MOORE, WILLIAM G., 257 W. Main St., Haddonfield, N. J.....1910
MORCOM, G. FREAN, 1815 N. Raymond Ave., Pasadena, Cal.....1886
MORGAN, ALBERT, Box 1323, Hartford, Conn.....1903
MORLEY, G. GRISWOLD, 2375 13th St., Boulder, Colo.....1911
MORE, R. L., Vernon, Texas.....1911
MORRIS, SIDNEY V., Bristol, Penn.....1911
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose, Mass.....1905
MURPHEY, Dr. EUGENE E., 444 Tellfair St., Augusta, Ga.....1903
MURPHY, ROBERT C., Brooklyn Inst. Museum, Eastern Parkway, Brooklyn, N. Y.....1905
MUSGRAVE, JOHN K., 3516 Shady Ave., Allegheny, Pa.....1909
MUSSELMAN, THOMAS EDGAR, Gem City Business College, Quincy, Ill.1910
MYERS, Mrs. HARRIET W., 306 Ave. 66, Los Angeles, Cal.....1906
MYERS, Miss LUCY F., Brookside, Poughkeepsie, N. Y.....1898
NASH, HERMAN W., Box 264, Pueblo, Colo.....1892
NELSON, JAMES ALLEN, Bureau of Entomology, Washington, D. C..1898
NEWHALL, DANIEL S., Strafford, Pa.....1908
NEWMAN, Rev. STEPHEN M., 6917 Bennett Ave., Chicago, Ill.....1898
NICHOLS, JOHN M., 46 Spruce St., Portland, Me.....1890
NICHOLS, JOHN TREADWELL, Am. Mus. Nat. Hist., New York City..1901
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....1903
NORRIS, J. PARKER, Jr., care of Evening Bulletin, Philadelphia, Pa...1904
NORRIS, ROY C., 725 N. 10th St., Richmond, Ind.....1904
NOVY, FRANK ORIEL, 721 Forest Ave., Ann Arbor, Mich.....1909
NOWELL, JOHN ROWLAND, Box 979, Schenectady, N. Y.....1897
OGDEN, Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.....1897
OLDYS, HENRY, Silver Springs, Md.....1896
*OLIVER, Dr. HENRY KEMBLE, 2 Newbury St., Boston, Mass.....1900
OSBURN, PINGREE S., 189 E. Colorado St., Pasadena, Cal.....1910
OVERTON, Dr. FRANK, Patchogue, N. Y.....1909
OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....1897
PACKER, JESSE E., 444 S. 4th St., Darby, Pa.....1910
PAINE, AUGUSTUS G., Jr., 18 West 49th St., New York City.....1886
PALADIN, ARTHUR, N. Y. State Museum, Albany, N. Y.....1911
PARKER, Mrs. BENJAMIN W., 4 Hopestill St., Dorchester Centre, Mass.1909
PARKER, Hon. HERBERT, South Lancaster, Mass.....1904

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PARSONS, R. L., 158 Raymond Ave., South Orange, N. J.....1911
PARSONS, WILLIAM, Box 422, Manila, P. I.....1909
PAUL, LUCIUS H., 59 West Miller St., Newark, New York.....1908
PEABODY, Rev. P. B., Blue Rapids, Kan.....1903
PEARSON, LEONARD S., 132 Beechtree Lane, Wayne, Pa.....1907
PEAVEY, ROBERT W., 791 Coney Island Ave., Brooklyn, N. Y.....1903
PECK, MORTON E., 292 N. Summer St., Salem, Ore.....1909
PECK, WALTER M., 15 9th St., East Providence, R. I.....1909
PENNINGTON, FRED ALBERT, 515 Chamber of Commerce, Chicago, Ill.1910
PEPPER, Dr. WM., 1811 Spruce St.. Philadelphia, Pa 1911
PERRY, Dr. ELTON, 610 Baylor St., Austin, Tex.....1902
PERRY, HENRY JOSEPH, 636 Beacon St., Boston, Mass.....1909
PETERS, ALBERT S., State Bank, Lake Wilson, Minn.....1908
PETERS, JAMES LEE, Walnut Ave., Jamaica Plain, Mass.....1904
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....1899
PHELPS, Mrs. MARIAN VON R., 70 West 49th St., New York City....1910
PHILIPP, PHILIP B., 220 Broadway, New York City.....1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....1891
PHILLIPS, JOHN CHARLES, Wenham, Mass.....1904
PIERREPONT, JOHN JAY, 1 Pierrepont Place, Brooklyn, N. Y.....1911
PILSBURY, FRANK O., Box 592, Walpole, Mass.....1909
PINCHOT, GIFFORD, Washington, D. C.....1910
PITCAIRN, WILLIAM G., 3330 Perrysville Ave., Allegheny, Pa.....1906
POE, Miss MARGARETTA, 1222 N. Charles St., Baltimore, Md.....1899
POMEROY, HARRY KIRKLAND, Box 575, Kalamazoo, Mich.....1894
POND, Miss ELLA J., 160 Lexington Ave., New York City.....1909
POOLE, ALFRED D., 401 W. 7th St., Wilmington, Del.....1901
POPE, ALEXANDER, 1013 Beacon St., Brookline, Mass.....1908
PORTER, LOUIS H., Stamford, Conn 1893
POST, WM. S.. 347 5th Ave, New York City.....1911
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....1892
PRICE, ARTHUR E., Grant Park, Ill.....1908
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....1906
PURDY, JAMES B., R. F. D. 4, Plymouth, Mich.....1893
RABORG, WM. A., Jr., Muirkirk, Md.....1909
RATHBORNE, R. C., Newark, N. J.....1911
RAYMOND, Mrs. C. E., 21 3d St., Hinesdale, Ill.....1910
RANKIN, CHAS. S. G., St. George's, Bermuda.....1909
RAWSON, CALVIN LUTHER, R. F. D. 2, Putnam, Conn.....1885
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass...1896
REDFIELD, ALFRED C., 56 Plympton St., Cambridge, Mass.....1907
REDFIELD, Miss ELISA WHITNEY, 29 Everett St., Cambridge, Mass..1897
REED, CHESTER A., 238 Main St., Worcester, Mass.....1904
REED, HUGH DANIEL, 108 Brandon Place, Ithaca, N. Y.....1900
REHN, JAMES A. G., Acad. Nat. Sciences, Philadelphia, Pa.....1901
REINBOLD, JOHN C., 576 Main St., Hackensack, N. J.....1909

RHOADS, CHARLES J., Bryn Mawr, Pa.....1895
RICE, JAMES HENRY, Jr., Summerville, S. C.....1910
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass...1900
RICHARDSON, C. H., Jr., Stanford University, Cal.....1903
RIDGWAY, JOHN L., Chevy Chase, Md.....1890
RIKER, CLARENCE B., Maplewood, N. J.....1885
ROBBINS, Miss ALMEDA B., Y. M. Library Association, Ware, Mass..1910
ROBERTS, JOHN T., JR., 350 Main St., Buffalo, N. Y.....1906
ROBERTS, WILLIAM ELY, 1920 Spring Garden St., Philadelphia, Pa...1902
ROBERTSON, HOWARD, Los Angeles, Cal.....1911
ROBINSON, ANTHONY W., 409 Chestnut St., Philadelphia, Pa.....1903
ROBINSON, LEWIS W., Cresskill, N. J.....1910
ROBINSON, Dr. PHILIP E., 102 Huntington Ave., Boston, Mass.....1908
*ROGERS, CHARLES H., 5 W. 82d St., New York City.....1904
ROLFE, ALFRED G., High School, Pottstown, Pa.....1909
ROLFE, Mrs. PERCIVAL B., 98 State St., Portland, Me.....1909
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....1896
ROPER, KENYON, Steubenville, Ohio.....1911
ROSS, GEORGE H., 23 West St., Rutland, Vt.....1904
ROSSIGNOL, GILBERT R., Jr., 2116 Bull St., Savannah, Ga.....1909
ROWLEY, JOHN, 42 Plaza Drive, Berkeley, Cal.....1889
SACKETT, CLARENCE, Rye, N. Y.....1910
SAGE, HENRY M., Menands Road, Albany, N. Y.....1885
SALLEY, FITZHUGH, Charleston Museum, Charleston, S. C.....1907
SALTONSTALL, JOHN LEE, Beverley, Mass.....1909
SANBORN, C. C., Highland Park, Ill.....1911
SANFORD, HARRISON, Litchfield, Conn.....1905
SASS, HERBERT RAVENEL, 23 Legare St., Charleston, S. C.....1906
SAUNDERS, ARETAS A., Forest Service, Anaconda, Mont.....1907
SAUVOLA, AUGUSTUS E., Chassell, Mich.....1909
SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y.....1895
SAVAGE, WALTER GILES, Delight, Ark.....1898
SCHANTZ, ORPHEUS M., 5215 W. 24th St., Cicero, Ill.....1907
SCHMIDT, WALDO, U. S. S. S. "Albatross," Pacific Sta. via San Francisco, Cal.....1910
SCHMUCKER, Dr. S. C., Rosedale Ave., West Chester, Pa.....1903
SCHWEDER, ARTHUR, 184 Upper Mountain Ave., Montclair, N. J....1911
SCOTT, HENRY R., 6 Charles River Sq., Boston, Mass.....1909
SEISS, COVINGTON FEW, 1338 Spring Garden St., Philadelphia, Pa.....1898
SHANNON, WM. PURDY, 1170 Broadway, New York City.....1908
SHARPLES, ROBERT P., West Chester, Pa.....1907
SHAW, WILLIAM T., 600 Linden Ave., Pullman, Wash.....1908
SHEARER, AMON R., Mont Belvieu, Tex.....1905
SHELDON, CHARLES, 140 W. 57th St., New York City.....1911

* Life Associate.

SHELTON, ALFRED, R F. D. 1, Petaluma Cal.....1911
*SHERMAN, Miss ALTHEA R., National, Iowa.....1907
SHIRAS, GEORGE, 3d, Stoneleigh Court, Washington, D. C.....1907
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C.....1910
SHOEMAKER, FRANK H., 206 Nebraska Hall, Station A, Lincoln, Neb..1895
SHORE, EDWIN W., 191 Campbell St., New Bedford, Mass.....1909
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis.....1899
SILLIMAN, HARPER, 4 Gramercy Park, New York City.....1902
SIMMONS, GEO. F., 701 Holman Ave., Houston, Texas.....1910
SINCLAIR, JOHN ABBOTT, New Hampton, N. H.....1909
SMALL, Capt. H. W., 212 N. Market St., Staunton, Va.....1911
SMITH, AUSTIN PAUL, Box 141, Brownsville, Texas.....1911
SMITH, BYRON L., 2140 Prairie Ave., Chicago, Ill.....1906
SMITH, Miss ETHEL M., 318 Strong Ave., Stevens Point, Wis.....1910
SMITH, Rev. FRANCIS CURTIS, Boonville, N. Y.....1903
SMITH, Prof. FRANK, Univ. of Ill., Urbana, Ill.....1909
SMITH, HORACE G., Historical and Nat. Hist. Society, Denver, Colo.1888
SMITH, Dr. HUGH M., 1209 M St. N. W., Washington, D. C.....1886
SMITH, JESSE L., 141 South 2nd St., Highland Park, Ill.....1907
SMITH, LOUIS IRVIN, Jr., 3809 Chestnut St., Philadelphia, Pa.....1901
SMITH, MYRTON T., 308 Pearl St., Hartford, Conn.....1909
SMITH, Mrs. RUTH COOK, Woodcliffe Lake, N. J.....1909
SMITH, WILBUR F., 198 Ely Ave., South Norwalk, Conn.....1909
SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va....1892
SNYDER, WILL EDWIN, R. F. D. 6, Beaver Dam, Wis.....1895
SOULE, Mrs. ETTA RICH, 11 Centre St., Watertown, Mass.....1909
SPAULDING, FRED B., Lancaster, N. H.....1894
SPELMAN, HENRY M., 48 Brewster St., Cambridge Mass.....1911
STANTON, Prof. J. Y., 410 Main St., Lewiston, Me.....1883
STANWOOD, Miss CORDELIA JOHNSON, Ellsworth, Me.....1909
STEELE, JOHN H., Flemington, N. J.....1906
STEPHENS, T. C., Morningside College, Sioux City, Iowa.....1909
STEVENS, Dr. J. F., Box 546, Lincoln, Neb.....1908
STILES, EDGAR C., 345 Main St., West Haven, Conn.....1907
ST. JOHN, ED. PORTER, 1566 Broad St., Hartford, Conn.....1911
STOCKBRIDGE, C. A., Fort Wayne, Ind.....1911
STONE, CLARENCE F., Branchport, N. Y.....1903
STONE, WM. D., Fayetteville, Ark.....1911
STRATER, Mrs. WM. E., 1114 3d St., Louisville, Ky.....1910
STRATTON-PORTER, Mrs. GENE, Limberlost Cabin, Geneva, Ind.....1906
STRECKER, JOHN KERN, Jr., Baylor Univ., Waco, Texas.....1909
STREET, J. FLETCHER, Beverly, N. J.....1908
STRODE, W. S., LEWISTON, Ill.....1911
STURGIS, S. WARREN, Groton, Mass.....1910

*Life Associate.

STUART, Miss KATHARINE H., 719 King St., Alexandria, Va.....1910
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....1896
STYER, Mrs. KATHARINE R., Concordville, Pa.....1903
SUMNER, Mrs. GRAHAM, Englewood, N. J.....1910
SURFACE, Prof. HARVEY ADAM, State Zoölogist, Harrisburg, Pa.....1897
SWAIN, JOHN MERTON, Box 142, Farmington, Me.....1899
SWEET, EDMUND H., Sturgis, S. D.....1910
SWENK, MYRON H., 3028 Starr Street, Lincoln, Neb.....1904
SWEZEY, GEORGE, 855 S. 15th St., Newark, N. J.....1901
TAYLOR, ALEXANDER R., 1410 Washington St., Columbia, S. C.....1907
TAYLOR, B. F., Columbia, S. C.....1911
TAYLOR, W. P., Univ. of California, Berkeley, Cal.....1911
TERRILL, LEWIS McI., 354 Elm Ave., Westmount, Quebec.....1907
TEST, CHARLES DARWIN, Golden, Col.....1906
TEST, Dr. FREDERICK CLEVELAND, 4620 Greenwood Ave., Chicago, Ill.....1892
TEST, LOUIS AGASSIZ, Rolla, Mo.....1908
THOMAS, Miss EMILY HINDS, 2000 Spruce St., Philadelphia, Pa.....1901
THOMPSON, CHAS. S., 2018 Oxley St., South Pasadena, Cal.....1909
THORNE, SAMUEL, 914 5th Ave., New York City.....1908
TILLEY, GEO. D., Darien, Conn.....1910
TINKER, ALMERIN D., 631 S. 12th St., Ann Arbor, Mich.....1907
TOPPAN, GEORGE L., 672 Graceland Ave., Chicago, Ill.....1886
TOWER, Mrs. KATE DENIG, 9 Newbury St., Boston, Mass.....1908
TOWNSEND, WILMOT, 272 75th St., Brooklyn, N. Y.....1894
TREGANZA, A. O., 610 Utah Savings & Trust Bldg., Salt Lake City, Utah.....1906
TRIPPE, THOMAS M., Howardsville, Colo.....1909
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....1899
TRUMBULL, J. H., Plainville, Conn.....1907
TUDBURY, WARREN C., 8 Mall St., Salem, Mass.....1903
TUFTS, LE ROY MELVILLE, Thrushwood, Farmington, Me.....1903
TUFTS, Miss MARY I., 163 Lewis St., Lynn, Mass.....1910
TUTTLE, Dr. ALBERT H., 1069 Boylston St., Boston, Mass.....1908
TUTTLE, Dr. CARL, Berlin Heights, Ohio.....1890
TUTTLE, HENRY EMERSON, 253 Yale Station, New Haven, Conn.....1909
TWEEDY, EDGAR, 13 Fairview Ave., Danbury, Conn.....1902
ULRICH, ALBERT GEORGE, 3307 Washington Ave., St. Louis, Mo.....1909
UNDERWOOD, WILLIAM LYMAN, Mass. Inst. Technology, Boston, Mass.....1900
UPHAM, Mrs. WILLIAM H., 212 3rd Ave., Marshfield, Wis.....1907
VALENTINE, Miss ANNA J., Bellefonte, Pa.....1905
VALENTINE, Miss LUCY W., 2 Trowbridge Terrace, Cambridge, Mass.1908
VAN BEUREN, Miss LOUISE, 21 W. 14th St., New York City.....1909
VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.....1885
VAN NAME, WILLARD GIBBS, N. Y. State Museum, Albany, N. Y....1900

VAN SANT, Miss ELIZABETH, 2960 Dewey Ave., Omaha, Neb.....1896
VANTASSELL, F. L., 116 High St., Passaic, N. J.....1907
VARICK, Mrs. WILLIAM REMSEN, 1015 Chestnut St., Manchester, N. H.1900
VETTER, Dr. CHARLES, 10 East 92d St., New York City.....1898
VICTOR, Dr. ED. W., 166 St. James Place, Brooklyn, N. Y.....1911
VISHER, STEPHEN S., Vermilion, S. D.....1904
VON LENGERKE, JUSTUS, 200 Fifth Ave., New York City.....1907
VON ROSSEM, ADRIAN, 223 N. Orange Grove, Pasadena, Cal.....1908
VROOMAN, ISAAC H., Jr., 282 Hamilton St., Albany, N. Y.....1908
WADSWORTH, CLARENCE S., 37 Washington St., Middletown, Conn...1906
WALES, EDWARD H., Hyde Park, N. Y.....1896
WALES, Miss ELLA, 186 Columbia Road, Dorchester, Mass.....1908
WALKER, CURTIS H., University of Chicago, Chicago, Ill.....1910
WALKER, ERNEST P., Paradox, Colo.....1911
WALKER, GEO. R., R. F. D. 3, Murray, Utah.....1909
WALKER, Dr. R. L., 355 Main Ave., Carnegie, Pa.....1888
WALLACE, Dr. A. H., 204 Bellevue Ave., Upper Montclair, N. J.....1907
WALLACE, JAMES S., 69 Front St., Toronto, Ontario.....1907
WALTER, Dr. HERBERT E., 53 Arlington Ave., Providence, R. I.....1901
WALTERS, FRANK, South Sandisfield, Mass.....1902
WARD, FRANK HAWLEY, 12 Grove Place, Rochester, N. Y.....1908
WARD, HENRY L., 882 Hackett Ave., Milwaukee, Wis.....1906
WARD, Mrs. MARTHA E., 25 Arlington St., Lynn, Mass.....1909
WARNER, EDWARD P., Concord, Mass.....1910
WARNER, GOODWIN, 920 Center St., Jamaica Plain, Mass.....1908
WEBER, J. A., Box 216, Palisades Park, N. J.....1907
WEIR, J. ALDEN, 471 Park Ave., New York City.....1899
WELLMAN, GORDON B., 54 Beltran St., Malden, Mass.....1908
WELLS, CHAS. S., Elwyn, Pa.....1911
WELLS, FRANK S., 916 Grant Ave., Plainfield, N. J.....1902
WENTWORTH, IRVING H., Matehuala, S. L. P., Mexico.....1900
WETMORE, ALEXANDER, care of Museum, Lawrence, Kansas.....1908
WETMORE, Mrs. EDMUND, 343 Lexington Ave., New York City.....1902
WEYGANDT, CORNELIUS, Wissahickon Ave., Mt. Airy, Philadelphia, Pa. 1907
WHARTON, WILLIAM P., Groton, Mass.....1907
WHEELER, EDMUND JACOB, 177 Pequot Ave., New London, Conn....1898
WHEELOCK, Mrs. IRENE G., 1040 Hinman Ave., Evanston, Ill.....1902
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H.....1891
WHITE, GEORGE R., Dead Letter Office, Ottawa, Ontario.....1903
WHITE, W. A., 158 Columbia Heights, Brooklyn, N. Y.....1902
WHITE, W. C., CHESTER, S. C.....1911
WICKERSHAM, CORNELIUS W., Cedarhurst, N. Y.....1902
WIKEL, HENRY H., Manual Training High School, Brooklyn, N. Y...1909
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....1895
WILCOX, Miss ALICE W., 165 Prospect St., Providence, R. I.....1908
WILCOX, T. FERDINAND, 115 W. 75th St., New York City.....1895

WILDE, MARK L. C., 311 N. 5th St., Camden, N. J. 1893
WILLARD, BERTEL G., Box 107, Millis, Mass. 1906
WILLARD, FRANK C., Tombstone, Arizona 1909
WILLETT, VICTOR JOHN AUSTIN, Wydecombe, Whiteman's Creek, B. C. 1909
WILLIAMS, HARRY C., 5344 Cabanne Ave., St. Louis, Mo. 1908
WILLIAMS, ROBERT S., New York Botanical Gardens, Bronx Park, New York City 1888
WILLIAMS, ROBERT W., Jr., Tallahassee, Fla. 1900
WILLIAMSON, E. B., Bluffton, Ind. 1900
WILLISTON, Mrs. S., 577 Belmont St., Belmont, Mass. 1911
WILSON, SIDNEY S., 219 S. 12th St., St. Joseph, Mo 1895
WINDLE, FRANCIS, 253 Dean St., West Chester, Pa. 1909
WISE, Miss HELEN D., 1514 13th St., N. W., Washington, D. C. 1910
WITHERBEE, Mrs. F. B., 106 Berkeley St., West Newton, Mass. 1906
WOOD, Mrs. GEO., 1313 Spruce St., Philadelphia, Pa. 1910
WOOD, J. CLAIRE, 179 17th St., Detroit, Mich. 1902
WOOD, NELSON R., Smithsonian Institution, Washington, D. C. 1895
WOOD, NORMAN A., 1216 South University Ave., Ann Arbor, Mich. 1904
WOODCOCK, ARTHUR ROY, Corvallis, Ore. 1901
WOODRUFF, FRANK M., 225 Wisconsin St., Chicago, Ill. 1904
WOODRUFF, LEWIS B., 24 Broad St., New York City 1886
WORCESTER, Mrs. ALFRED, Bacon St., Waltham, Mass. 1908
WORTHINGTON, WILLIS W., Shelter Island Heights, N. Y. 1889
WRIGHT, ALBERT H., 115 Stewart Ave., Ithaca, N. Y. 1906
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich. 1907
WRIGHT, HORACE WINSLOW, 107 Pinckney St., Boston, Mass. 1902
WRIGHT, HOWARD W., 830 N. Orange Grove Ave., Pasadena, Cal. 1907
WRIGHT, SAMUEL, Conshohocken, Pa. 1895
WYMAN, LUTHER E., R. F. D. 3, Nampa, Idaho 1907
YOUNG, Miss H. F., Maple & Monroe Sts., Hinsdale, Ill 1911
YOUNG, JOHN A., 371 Dundas St., London, Ontario 1907
YOUNG, JNO. P., 1510 5th Ave., Youngstown, Ohio 1911
ZAPPEY, WALTER R., 25 Rindgefield St., North Cambridge, Mass. 1905
ZIMMER, J. T., 42d and Holdridge Sts., Lincoln, Neb. 1908

DECEASED MEMBERS.

Fellows.

	Date of Death
Aldrich, Charles	March 8, 1908
Baird, Spencer Fullerton	Aug. 19, 1887
Bendire Charles Emil	Feb. 4, 1897
Coues, Elliott	Dec. 25, 1899
Goss, Nathaniel Stickney	March 10, 1891
Holder, Joseph Bassett	Feb. 28, 1888
Jeffries, John Amory	March 26, 1892
McIlwraith, Thomas	Jan. 31, 1903
Merrill, James Cushing	Oct. 27, 1902
Purdie, Henry Augustus	March 29, 1911
Sennett, George Burritt	March 18, 1900
Trumbull, Gurdon	Dec. 28, 1903
Wheaton, John Maynard	Jan. 28, 1887

Honorary Fellows.

Blanford, William Thomas	June 23, 1905
Bocage, J. V. Barboza du	July —, 1908
Burmeister, Hermann	May 1, 1892
Cabanis, Jean	Feb. 20, 1906
Gätke, Heinrich	Jan. 1, 1897
Giglioli, Henry Hillyer	Dec. 14, 1909
Gundlach, Juan	March 14, 1896
Gurney, John Henry	April 20, 1890
Hartlaub, Gustav	Nov. 20, 1900
Huxley, Thomas Henry	June 29, 1890
Kraus, Ferdinand	Sept. 15, 1895
Lawrence, George Newbold	Jan. 17, 1895
Meyer, Adolf Bernard	Feb. 5, 1911
Milne-Edwards, Alphonse	April 21, 1900
Newton, Alfred	June 7, 1907
Parker, William Kitchen	July 3, 1890
Pelzeln, August von	Sept. 2, 1891
Salvin, Osbert	June 1, 1898
Saunders, Howard	Oct. 20, 1907
Schlegel, Hermann	Jan. 17, 1884
Seebohm, Henry	Nov. 26, 1895
Sharpe, Richard Bowdler	Dec. 25, 1909
Taczanowski, Ladislas	Jan. 17, 1890

Corresponding Fellows.

Altum, C. A. ..... Jan. 1, 1900
Anderson, John ..... Aug. 16, 1900
Baldamus, Eduard ..... Oct. 30, 1893
Blakiston, Thomas Wright ..... Oct. 15, 1891
Blasius, Rudolph ..... Sept. 21, 1907
Bogdanow, Modest Nikolaevich ..... March 4, 1888
Bryant, Walter E. ..... May 21, 1905
Buller, Walter Lawry ..... July 19, 1906
Cooper, James Graham ..... July 19, 1902
Cordeaux, John ..... Aug. 1, 1899
David, Armand ..... Nov. 10, 1900
Fatio, Victor ..... March 19, 1906
Haast, Julius von ..... Aug. 15, 1887
Hargitt, Edward ..... March 19, 1895
Hayek, Gustav Edler von ..... Jan. 9, 1911
Holub, Emil ..... Feb. 21, 1902
Homeyer, Eugen Ferdinand von ..... May 31, 1889
Layard, Edgar Leopold ..... Jan. 1, 1900
Leverkühn, Paul ..... Dec. 5, 1905
Lyttleton, Thomas Lord Lilford ..... June 17, 1896
Marschall, August Friedrich ..... Oct. 11, 1887
Malmgren, Anders Johan ..... April 12, 1897
Middendorff, Alexander Theodore von ..... Jan. 28, 1894
Mosjisovics, Felix G. Hermann August ..... Aug. 27, 1897
Oates, Eugene William ..... Nov. 16, 1911
Oustalet, Emile ..... Oct. 23, 1905
Philippi, R. A. ..... Aug. —, 1904
Prejevalski, Nicolas Michaelovich ..... Oct. 20, 1887
Prentiss, Daniel Webster ..... Nov. 19, 1899
Pryer, Harry James Stovin ..... Feb. 17, 1888
Radde, Gustav Ferdinand ..... —— 1903
Schrenck, Leopold von ..... Jan. 20, 1894
Séleys-Longschamps, Edmond de ..... Dec. 11, 1900
Severtznow, Nicolai Aleksewich ..... Feb. 8, 1885
Shelley, George Ernest ..... Nov. 29, 1910
Stevenson, Henry ..... Aug. 18, 1888
Tristram, H. B. ..... March 8, 1906
Wharton, Henry T. ..... Sept. —, 1895
Woodhouse, Samuel W. ..... Oct. 23, 1904

Members.

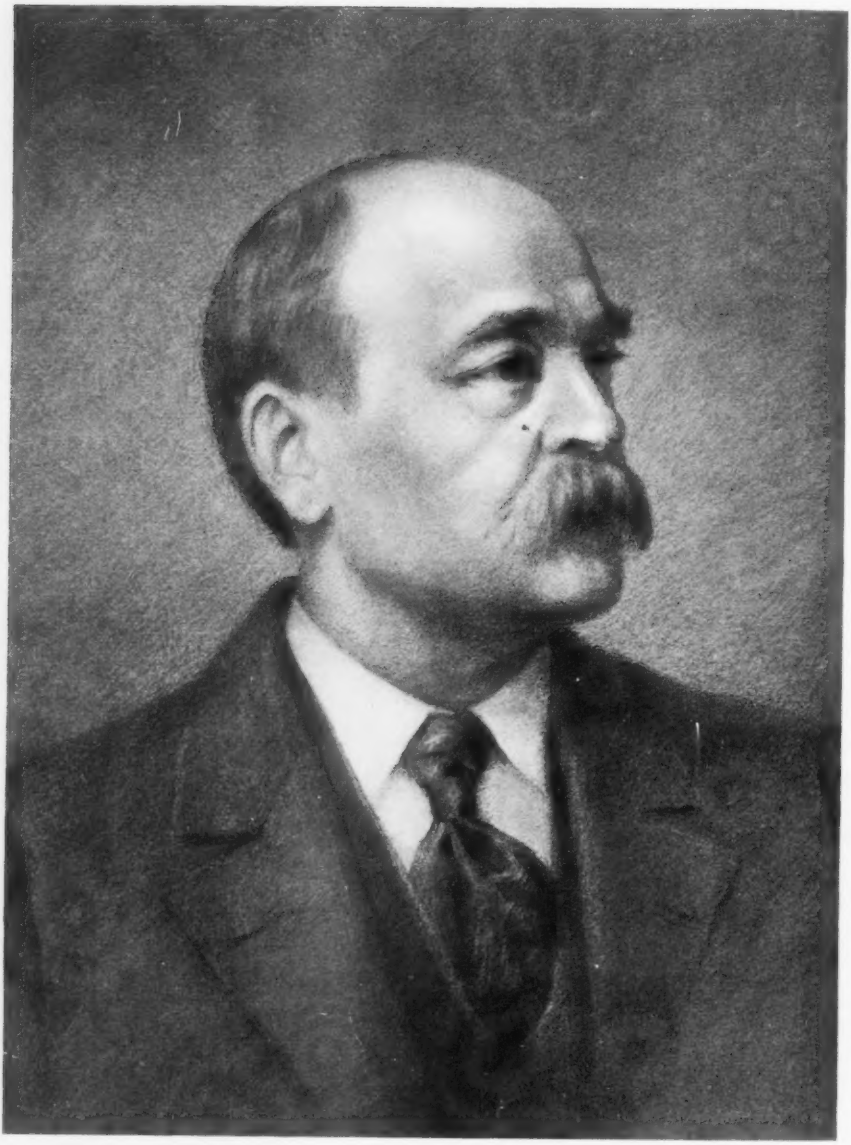
Fannin, John.....June 20, 1904
Hardy, Manly.....Dec. 9, 1910
Judd, Sylvester Dwight.....Oct. 22, 1905
Ralph, William LeGrange.....July 8, 1907
Whitman, Charles Otis.....Dec. 6, 1910

Associates.

Adams, Charles F.....May 20, 1893
Allen, Charles Slover.....Oct. 15, 1893
Antes, Frank T.....Feb. 6, 1907
Atkins, Harmon Albro.....May 19, 1885
Avery, William Cushman.....March 11, 1894
Bailey, Charles E.....——, 1905
Barlow, Chester.....Nov. 6, 1902
Baur, George.....June 25, 1898
Beckham, Charles Wickliffe.....June 8, 1888
Bill, Charles.....April —, 1897
Birtwell, Francis Joseph.....June 29, 1901
Boardman, George Augustus.....Jan. 11, 1901
Bolles, Frank.....Jan. 10, 1894
Brackett, Foster H.....Jan. 5, 1900
Breese, William Lawrence.....Dec. 7, 1889
Breninger, George Frank.....Dec. 3, 1905
Brennan, Charles F.....Mar. 21, 1907
Brokaw, Louis W.....Sept. 3, 1897
Brown, John Clifford.....Jan. 16, 1901
Browne, Francis Charles.....Jan. 9, 1900
Brownson, W. H.....Sept. 6, 1909
Burnett, Leonard E.....March 16, 1904
Cairns, John S.....June 10, 1895
Call, Aubrey Brendon.....Nov. 20, 1901
Campbell, Robert Argyll.....April —, 1897
Canfield, J. B.....Feb. 18, 1904
Carleton, Cyrus.....Nov. 15, 1907
Carter, Edwin.....—— 1900
Carter, Isabel Paddock.....Sept. 15, 1907
Chadbourne, Mrs. Arthur Patterson.....Oct. 4, 1908
Charles, Fred Lemar.....May 6, 1911
Clark, John Nathaniel.....Jan. 13, 1903
Coe, W. W.....April 26, 1885
Colburn, William W.....Oct. 17, 1899

COLLETT, ALONSO M. ..... Aug. 22, 1902
CONANT, Mrs. THOS. O. ..... Dec. 28, 1907
CORNING, ERASTUS, Jr. ..... April 9, 1893
DAFFIN, WM. H. ..... April 21, 1902
DAKIN, JOHN ALLEN ..... Feb. 21, 1900
DAVIS, WALTER R. ..... April 8, 1907
DEXTER, NEWTON ..... July 27, 1901
DODGE, JULIAN MONTGOMERY ..... Nov. 23, 1909
ELLIOTT, SAMUEL LOWELL ..... Feb. 11, 1889
FAIRBANKS, FRANKLIN ..... April 24, 1895
FERRY, JOHN FARWELL ..... Feb. 11, 1910
FISHER WM. HUBBELL ..... Oct. 6, 1909
FOWLER, JOSHUA LOUNSBURY ..... July 11, 1899
FULLER, CHARLES ANTHONY ..... Mar. 16, 1906
GESNER, ABRAHAM HERBERT ..... April 30, 1895
GOSS, BENJAMIN FRANKLIN ..... July 6, 1893
HATCH, JESSE MAURICE ..... May 1, 1898
HOADLEY, FREDERICK HODGES ..... Feb. 26, 1895
HOLMES, LARUE KLINGLE ..... May 10, 1906
HOOPES, JOSIAH ..... Jan. 16, 1904
HOWLAND, JOHN SNOWDON ..... Sept. 19, 1885
INGERSOLL, JOSEPH CARLETON ..... Oct. 2, 1898
JENKS, JOHN WHIPPLE POTTER ..... Sept. 27, 1894
JESURUN, MORTIMER ..... March —, 1905
JOUY, PIERRE LOUIS ..... March 22, 1894
KELKER, WM. A. ..... Feb. 15, 1908
KNIGHT, WILBUR CLINTON ..... July 8, 1903
KNOX, JOHN C. ..... July 9, 1904
KNOX, JOHN COWING ..... June 1, 1904
KOCH, AUGUST ..... Feb. 15, 1907
KUMLIEN, LUDWIG ..... Dec. 4, 1902
KUMLIEN, THURE ..... Aug. 5, 1888
LAWRENCE, ROBERT HOE ..... April 27, 1897
LEE, LESLIE ALEXANDER ..... May 20, 1908
LINDEN, CHARLES ..... Feb. 3, 1888
LLOYD, ANDREW JAMES ..... June 14, 1906
MABBETT, GIDEON ..... Aug. 15, 1900
MAITLAND, ALEXANDER ..... Oct. 25, 1907
MARBLE, CHARLES C. ..... Sept. 25, 1900
MARCY, OLIVER ..... March 19, 1899
MARIS, WILLARD LORRAINE ..... Dec. 11, 1895
MCEWEN, DANIEL C. ..... Nov. 1, 1909
MCKINLAY, JAMES ..... Nov. 1, 1899
MEAD, GEORGE SMITH ..... June 19, 1901
MINOT, HENRY DAVIS ..... Nov. 13, 1890
MORRELL, CLARENCE HENRY ..... July 15, 1902

NICHOLS, HOWARD GARDNER.....June 23, 1896
NIMS, LEE.....March 12, 1903
NORTHROP, JOHN I.....June 26, 1891
PADDOCK, ISABEL M.....Sept. 15, 1907
PARK, AUSTIN F.....Sept. 22, 1893
PAULMIER, FREDERICK CLARK.....March 3, 1906
POMROY, GRACE V.....May 14, 1906
RAGSDALE, GEORGE HENRY.....March 25, 1895
READY, GEORGE H.....March 20, 1903
RAWLE, FRANCIS WILLIAM.....June 12, 1911
RICHARDSON, JENNESS.....June 24, 1893
ROBINS, MRS. EDWARD.....July 2, 1906
SAND, ISABELLA LOW.....April 20, 1906
SELOUS, PERCY SHERBORN.....April 7, 1900
SLATER, JAMES H.....Feb. —, 1895
SLEVIN, THOMAS EDWARDS.....Dec. 23, 1902
SMALL, EDGAR ALBERT.....April 24, 1884
SMITH, CLARENCE ALBERT.....May 6, 1896
SNOW, FRANCIS HUNTINGTON.....Sept. 20, 1908
SOUTHWICK, JAMES MORTIMER.....June 3, 1904
STOWE, W. H.....March —, 1895
SWEIGER, MRS. J. L.....March 23, 1907
TAYLOR, ALEX. O'DRISCOLL.....April 10, 1910
THOMPSON, MILLET T.....Aug. 7, 1907
THORNE, PLATTE MARVIN.....March 16, 1897
THURBER, EUGENE CARLETON.....Sept. 6, 1896
VENNOR, HENRY GEORGE.....June 8, 1884
WATERS, EDWARD STANLEY.....Dec. 26, 1902
WILLARD, SAMUEL WELLS.....May 24, 1887
WISTER, WILLIAM ROTCH.....Aug. 21, 1911
WOOD, WILLIAM.....Aug. 9, 1885
WOODRUFF, EDWARD SEYMOUR.....Jan. 15, 1909
WORTHEN, CHARLES K.....May 27, 1909
YOUNG, CURTIS CLAY.....July 30, 1902



Very sincerely Yours,
H. A. Purdie.

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XXIX. JANUARY, 1912. NO. 1.

IN MEMORIAM: HENRY AUGUSTUS PURDIE.

Born December 16, 1840 — Died March 29, 1911.

BY WILLIAM BREWSTER.

Plate I.[1]

HENRY AUGUSTUS PURDIE was born on the sixteenth of December, 1840, in Beüjah, Asia Minor, a suburban town about five miles to the eastward of Smyrna. He died in Boston, Massachusetts, on the twenty-ninth of March, 1911. His father, John Purdie, was Scotch, although born (in 1803) in London, and reared there, his father being employed in the Bank of England. After his marriage John Purdie served as British Consul at Adalia on the southeast coast of Asia Minor, where he died in 1856. Henry's mother, Eleanor (Pratt) Purdie, was descended from old New England stock and born in Charlestown, Massachusetts, in 1808. Her father, John Pratt, was a merchant captain and a partner of Judah Truro of Boston.

In 1842 Henry Purdie, with his mother and his elder brother Alfred, came in a sailing vessel from Smyrna to Boston where, and at Billerica (Massachusetts), he spent the next two or three years. He was then, as certain of his friends and relatives still remember, a beautiful and interesting child, active, graceful, gentle, easily winning the affection of those about him and attracting much attention during his walks abroad, when he was usually dressed in plaid kilts and black velvet jacket, and accompanied by his Greek

[1] From a crayon sketch by Miss Evelyn Purdie, based on recent photographs.

nurse, a strikingly handsome woman. In 1845 he returned with his mother and brother to the Levant, where the family were reunited at Adalia. Here the conditions of life were such that the Purdie children had to spend most of their time in the house and in a large yard and garden connected with it which served them well as a playground; but on Sundays, after listening to a Church of England service and to a Unitarian discourse, they were accustomed to walk out into the country beyond the city walls accompanied by a servant and two or three janizaries to keep off the rabble of hooting native children who followed them and to carry their lunch, which was commonly eaten beside an iris-lined brook, or in an olive grove, or beneath some spreading plane tree. Such an excursion might end in an exciting climb down precipitous limestone cliffs, over which brooks cascaded into the sea, on reaching which the children would be met by a boat sent there to bring them home. Sometimes they were rowed into romantic-looking caves abounding with wild birds, or to pebbly beaches fringed with oleanders, where they bathed. When confined to the house they often amused themselves by cutting pictures from the 'Illustrated London News' and throwing them from an overhanging window into the street, where a crowd of Turkish or Greek boys would soon assemble to scramble over one another for them. Towards evening they usually resorted to the kiosk on top of the house whence one might look out over red-tiled roofs and gardens of orange, lemon, fig, vine and mulberry to the blue sea, beyond which rose lofty ranges of mountains bounding the Bay of Pamphilia.

In the summer of 1846 the family traveled with a caravan to Buldur, a remote Turkish village among the Taurus mountains about a hundred miles from the seacoast. During this journey each of the children occupied a box supplied with bedding and a canopy and slung on the side of a large mule. They, with their mother and a Greek maid, passed the entire summer at Buldur away from all European civilization. They were well treated by the village children, who were more polite and friendly than those at Adalia. In the afternoon they would walk to a large salt lake near at hand, or to some garden or vineyard where they gathered fruit while the attendant servant told them wonderful stories.

It is to Alfred Purdie, chiefly, that I am indebted for knowledge of these early experiences of the brothers in Asia Minor. Henry

recalled them only dimly in after years, although he often spoke of them in general terms, and occasionally the fragrance of an iris or the sound of a rushing brook would prompt him to exclaim, "This reminds me of Adalia." His mother taught him his letters there. After leaving Adalia he and his brother were for some months at a school kept by an American lady in Bonabat near Smyrna, and later Henry was sent to a higher grade English school in the same village.

In 1852 Henry Purdie came again to Boston with his mother. The next year the family, with the exception of the father, who remained at Adalia, were living in West Newton, where Henry attended the Model School. In 1854 he was one of the first pupils at the English and Classical School, conducted by the late Nathaniel T. Allen. After leaving the latter school he went to one kept by a Mr. Tower in the basement of Park Street Church. During the period just referred to, he and his brother Alfred spent much of their leisure time in boating or swimming in Charles River — a lonely stream in those days, in tracing brooks to their sources, in climbing hills, and in wandering through remote woodlands. They made the usual boys' collections of minerals, shells and other "curios," among which was a huge hornet's nest, secured by rising at three o'clock one summer morning and walking over Weston Bridge to the foot of Doublet Hill where the prize was found in some scrub growth and its rightful owners smoked out with fumes of sulphur.

As a boy, Henry was not unlike other lads of his own age, except that he was more gentle than most, never indulging in wanton or thoughtless cruelty to any living creature. He was fond of pets, but had little opportunity to indulge his love for them. When about fourteen years of age, he began a series of chemical experiments in connection with which he had advice from his cousin, the late Professor J. P. Cook. Apparently his taste for them was soon replaced by the deeper and more lasting interest which so dominated his after life, viz., that in ornithology, for by 1858, as his brother Alfred is fortunately able to remember definitely, he had already begun to devote himself to it and to collect the nests and eggs of Massachusetts birds.

Henry's first venture for a living, after some preliminary work

in a machine shop, which he did not like, was in Boston, about 1859, as a clerk with Lemme, Price & Company, manufacturing jewelers. After the dissolution of this firm, he was for about a month similarly employed by Shreve, Crump & Low. The Civil War being then well under way, he, with two of his friends, in February, 1862, enlisted in the navy, serving for over a year as yeoman, having charge of guns and ammunition on the U. S. barque 'James L. Davis' of the Gulf blockading squadron. The life, as it appears in his journals, was not very eventful or exciting except when, as occasionally happened, a blockade runner was pursued and captured. Whenever the men went ashore to forage for supplies and he accompanied them, he seems to have given his attention chiefly to observing birds, sometimes collecting a few eggs. He had two or three warm friends aboard the vessel, but most of his associates were uncongenial, and the constant discipline and routine of naval life were very irksome to him, while he was rarely free from seasickness. In the spring of 1863, he obtained his discharge and returned to Boston, where he soon found employment at the State House in the office of the Massachusetts State Board of Charities, under Mr. Frank B. Sanborn. Here he performed clerical work and visited, inspected and reported on, various State institutions, such as almshouses, asylums, etc. He continued to hold this position for about thirty-five years. After retiring from it in 1898, he greatly enjoyed his well-earned freedom and the opportunities it brought for indulging in the study of ornithology, botany and nature, to which he devoted himself during the remainder of his life. Living with his sister in a quiet side street on Beacon Hill, he had not far to go to reach his favorite reading haunts, the Boston Athenæum and Public Libraries, in one or another of which he might be found at almost any hour of the day or evening, especially in winter, poring over some book or pamphlet relating to birds or plants. Being a diligent and methodical student of all such literature past and present, he kept himself intimately informed respecting it and apparently derived from it quite as much pleasure and satisfaction as he did from the acquisition of first-hand knowledge obtained in woods and fields. The latter were not neglected, of course. On the contrary, he visited them frequently in all seasons, and sometimes almost

daily in spring, summer and autumn, going to them quite as often alone as with companions, for, like all sincere lovers of nature, he had no aversion to solitary walks. During this period, his hearing, once acute and discriminating, became duller and duller until only the loudest bird songs, coming from very near at hand, attracted his notice. His eyesight, never of the best, was steadily failing too. Largely because of these unfortunate and ever-increasing disabilities, he turned his attention more and more from birds to plants, until the latter came to absorb the greater part of it, at least whenever he went afield, filling him with fresh enthusiasm and interest, and bringing him into intimate relations with new friends. Yet the old ornithological interests and friendships were never laid aside or neglected wherever it was possible to maintain them. With the plant life about Boston he became, in the course of only a few years, surprisingly familiar. Many a rare or locally-restricted species was ferreted out by him, often where its presence had hitherto been unknown, if not quite unsuspected. There were certain individual living plants or restricted groups of them to which he especially devoted himself, visiting them annually at just the time when they were in the perfection of their bloom and evidently regarding such attention as no less a duty than a pleasure. These field studies were conducted very quietly, but so sedulously, intelligently and effectively that in the end they resulted in the acquisition of a store of information concerning the scope and value of which Mr. Walter Deane has been kind enough to express for me the following authoritative and pleasingly favorable opinion:

"Mr. Purdie was passionately fond of the study of plant life, taking special interest in certain groups of flowering species and vascular cryptogams. He was, strictly speaking, a field botanist, the systematic study of specific relations, acquired in the herbarium by work on the material there, not being much to his taste. Hence many groups, including the Najadaceæ, Gramineæ, Cyperaceæ, and the like, that require much closet study, did not particularly interest him, but for such difficult genera as *Desmodium*, *Lespedeza*, *Aster*, *Solidago*, and many others his interest was unbounded. From earliest spring to late autumn and often in the winter he loved to wander over field, wood and meadow, studying from close observation the abundant material ever at

hand. In this he was indefatigable, and few, if any, knew better the localities where choice plants grew. As a local botanist he held a high rank. He had a keen power of discrimination in the field, and was so thoroughly acquainted by long experience with the finer characters that distinguish closely related species that he often surprised his friends by naming difficult plants when seen from quite a distance. He was especially strong in his knowledge of the trees and shrubs of eastern Massachusetts. As Mr. Purdie did not travel much his field observations were largely confined to Massachusetts, but wherever he went he soon acquired a most excellent knowledge of the flora of that region. As an example of this love for the flora about him and desire to know the plants, may be mentioned his visits to his brother's home in Florida. His interest in the flora there is shown by the frequent communications he sent to the Gray Herbarium, accompanied by specimens, regarding perplexing species. In the summer of 1902 he called the attention of Mr. George E. Davenport, the late eminent pteridologist, to a strange form of *Aspidium spinulosum* (O. F. Müller) Sw., our Shield or Wood Fern, which he had found in Concord, Massachusetts. This form proved of good varietal distinction, and Mr. Davenport wished to associate Purdie's name with it. Our friend protested with characteristic modesty, and the plant was published as var. *Concordianum*, but it will always be associated with the discoverer by his friends. It was the same modesty that prevented him from publishing from time to time his botanical discoveries."

Joining the New England Botanical Club, as a Resident Member, on June 4, 1897, Mr. Purdie afterwards attended its meetings (held in Boston monthly from October to June of each year) more or less regularly, but seldom spoke at them. He was also a member of the Massachusetts Horticultural Society and took much interest in its popular exhibitions of fruits and flowers in Horticultural Hall, Boston, occasionally contributing to them collections of flowering goldenrods or other native plants, which attracted no little attention and were sometimes mentioned in the newspapers.

My personal acquaintance with Henry Purdie began about 1865, when I met him, for the first time, in a basement room of the State House, where the state collection of mounted birds (now at Am-

herst) was kept, and where E. A. Samuels had his cabinets of birds' eggs. Thither Ruthven Deane and I went rather frequently in early youth, taking eggs to exchange with Mr. Samuels, for whose memory there will always remain a warm place in both our hearts, for he was very kind and helpful to us,— as to all lads having tastes similar to his own and craving the ornithological lore and guidance which he was ever ready to impart. I was there one hot day in early summer when Henry Purdie came into the room, and we were introduced. He was then about twenty-five years old and, as I clearly remember, slight and graceful of figure, almost if not quite as bald as in later years, and very neatly dressed. We saw one another occasionally in the same place during the next few years, but it was not until 1869 that I began to know him at all well. Not long after that, our acquaintance ripened into a friendship which, without mar or interruption of any kind, continued up to the very end of his life. About the same time he established similarly close and lasting relations with Ruthven Deane, and somewhat less intimate yet very friendly ones with Henry W. Henshaw, Harry B. Bailey and W. E. D. Scott. These affiliations drew him with ever-increasing frequency to Cambridge, particularly between the years 1870 and 1882, a period of great ornithological activity and enthusiasm in and about the University city, especially memorable for the founding of the Nuttall Ornithological Club in 1873, and for the publication of its 'Bulletin' which began in 1876. Mr. Purdie took deep interest and had large share in the organization and early development of this Club. He was its President from March 20, 1875, to February 12, 1876; its Vice-President from 1873 to March 20, 1875; its Secretary from February 12, 1876, to December 1, 1885; its Corresponding Secretary from December 3, 1877, to December 9, 1878; a member of its Council from January 23, 1893, to December 7, 1896. There were few of its earlier meetings at which he failed to contribute something in the way of original field notes or of trenchant yet kindly criticism of those furnished by other members. Sometimes he would bring specimens of rare birds or eggs to show, or would read passages from ornithological books or pamphlets which few, if any, of us had ever seen or heard of, and which he had unearthed in one or another of the Boston libraries. He had then, as well as

later, the keenest possible interest in the literature of ornithology and kept in close touch with it. Thus, throughout a period extending over at least a dozen or fifteen years, he was one of the leading spirits of the Nuttall Club, taking a prominent part in all its affairs and rendering it most loyal and efficient service. But with advancing years he came to its meetings somewhat less often than before although not infrequently. His very last appearance was at one held on the evening of March 6, 1911, less than a week before his final illness began, and but little more than three weeks before he died.

The editors of that pioneer journal, the 'Bulletin of the Nuttall Ornithological Club,' were often indebted to Mr. Purdie for valuable assistance or critical advice. During the eight years of its existence, he contributed to its pages no less than twenty-five articles and notes of varying length. Among the earlier of these were two,— a short review signed by his initials merely, and a seven-page article under his full name,— in which he criticised rather sharply, but in the main quite justly, certain statements and rulings made about a year before, in a 'Catalogue of the Birds of New England,' by Dr. T. M. Brewer. These papers excited general interest at the time of their appearance. They show better, perhaps, than anything else that Mr. Purdie ever wrote, the scope and accuracy of his ornithological knowledge when he was in his prime, and the ability he possessed for temperate and logical argument.

Having been included, as a matter of course, among those who were invited to take part in the organization of the American Ornithologists' Union and being present at its first Congress held in New York City on September 26, 1883, Henry Purdie became one of its Original Members or Founders, now known as Fellows. He retained this membership up to the time of his death, but his attendance at meetings of the Union was mainly restricted to those held in Boston and Cambridge. Although during the earlier years of its existence, he served on certain of its Committees, his name is not included in any of its lists of officers. His only communication to the pages of its journal, 'The Auk,' was a brief note relating to the occurrence of the Prothonotary Warbler in Massachusetts, published in 1886. He was a member of the Boston Society of

Natural History from January 3, 1866, to October, 1875, but its publications do not apparently contain anything from his pen, although they mention an ornithological record made by him at one of its meetings.

The articles and notes which appeared under or over Henry Purdie's name, of which a list will be given at the end of this memoir, by no means represent in full the contributions which he made to the literature of ornithology. For some of his most important service of this kind was rendered indirectly, and in a sense anonymously, through assistance and advice given to other writers. Thus he helped Mr. Samuels very materially in the preparation of the 'Ornithology and Oölogy of New England,'[1] published in 1867, and his critical knowledge and ability were drawn upon still more largely by Dr. Coues in connection with the production of 'New England Bird Life,' which appeared in 1881. As was eminently characteristic of him, he seemed not only indifferent concerning the credit which he received for such work, but actually averse to having anything said about it. Even his closest friends were often unable to inform themselves definitely through him as to the precise nature and amount of it that he performed.

During the earlier years of his life, Mr. Purdie was an active, persistent and very successful collector, especially of nests and eggs of New England birds. The birds themselves were seldom molested by him, for he was averse to taking animal life of any kind, an indifferent shot, and gifted with little or no skill in the art of taxidermy. Nevertheless, he accumulated several hundred bird skins, most of which were obtained by gift or purchase. At the time of which I am now writing, his sense of hearing was remarkably keen and critical, but he was very near-sighted and habitually wore eye-glasses. His high enthusiasm, shrewd powers of observation and deep and reverent love of nature combined to make him a delightful and much-sought companion for out-of-door excursions of every kind. Despite his intimate association with woods and

[1] In the Preface to this work Mr. Purdie's name receives little more than casual mention, but in a footnote to page 320 of the main text Mr. Samuels expresses indebtedness to him for the use of "full and copious notes and memoranda on the arrival of species, which are of value, having been conducted for several years."

fields, he seemed, oddly enough, not to be quite at home in them, partly, no doubt, because he commonly went to them dressed in ordinary city clothes, still more largely, perhaps, because he had an awkward, blundering way of getting over fences, walls and ditches, and through dense brush. Yet while another, better equipped for such undertakings and apparently more skilful in performing them, was ranging about quietly and systematically, it very often happened that Henry Purdie was the first to detect the elusive bird, the cunningly concealed nest, or the rare plant, of which they were both in quest, apparently stumbling on it quite by chance, but in reality guided to it, without doubt, by that intuitive sense which is possessed by all good hunters and which he evidently had in generous measure, making frequent use of it, however unconsciously, whenever seeking hidden things. The collection of nests and eggs [1] which he formed, although not large, contained an excellent representation of those of the commoner birds of eastern Massachusetts besides a considerable number of specimens intrinsically rare or of exceptional local interest, from this and various other parts of North America, but chiefly from New England. Among the latter were several sets of the beautiful eggs of the Olive-sided Flycatcher, which he took in the neighborhood of Boston at various times before 1875. Prior to the year 1870, he had confined his field work mostly to localities lying within easy reach of West Newton, where he lived, but during the next following decade he gave it wider scope, collecting with me at Lake Umbagog (June 13–28, 1873, September 14–19, 1874, and May 10–June 24, 1876); with J. N. Clark at Saybrook, Connecticut (in June, 1875); with Ruthven Deane and Robert R. McLeod at Houlton, Maine (in June, 1878). In June, 1881, he made a tour through New Brunswick, where he met Montague Chamberlain for the first time (they afterwards became intimate friends) and spent eleven days at Campbellton on Bay Chaleur. Still later, after he had become interested in botany, he went to the White Mountains repeatedly in summer, was with me in camp at Lake Umbagog on one or two occasions in autumn, and twice visited his brother Alfred in Florida, remaining there for the greater part of two

[1] He gave a few of these to ornithological friends and most of the others to the Museum of Comparative Zoölogy, Cambridge, several years before he died.

winters. Towards the close of his life, he found much to attract and interest him in Concord, Massachusetts, where, at a log cabin on a wooded hillside by the river, or at an old farm-house surrounded by fields, orchards and woodland, he was my frequent and ever welcome guest. Here the unconventional, out-of-door life suited his simple tastes, and he could indulge as freely as he chose in the botanical rambles which he so loved. If, as seemed evident, he derived pleasure from those visits, he gave much more of it than he received, endearing himself to every one about the place by his unfailing kindness and thoughtfulness of word and deed.

It has been said that "every man's faults are the shadows of his virtues." This was certainly true in Henry Purdie's case, for, if not literally faults, the extreme gentleness, sensitiveness and modesty, which were among his most pronounced attributes, unquestionably operated to his worldly disadvantage, stifling whatever ambition he may have possessed and preventing him from taking a place among scientific men and affairs which he might otherwise have achieved, and to which he was fairly entitled by reason of his shrewd intelligence, excellent critical ability and wide knowledge and experience as an ornithologist and botanist. He had high standards of personal honor and virtue, but was very lenient with respect to the failings of others. His estimate of his own ability and attainments was so genuinely modest that, whenever any one spoke of them in terms of appreciation, he always seemed surprised and often incredulous. He was canny and very knowing in a Scotch sort of way and had keen intuitive judgment of human character — besides many other things — which was rarely, if ever, mistaken. His temperament often made decision,— about even small affairs,— almost a martyrdom, and thereby lost him opportunities which should have been promptly grasped; but nearly always his doubt hung on the fear that some one else might be inconvenienced or disappointed.

Most of the shortcomings just alluded to were obviously the direct and not unnatural outcome of an exceptionally large and tender heart, of an abnormally sensitive conscience, of a delicately refined nature, and, above all, of a deep and abiding concern for the welfare and happiness of others. Even if such virtues must

cast "shadows" more or less detrimental to the material prosperity of those who possess them, our world would be a better place to live in were it more generally overshadowed by them.

As a matter of course, they won for Mr. Purdie many appreciative and loving friends. At a surprise party given for him in Cambridge on his seventieth and last birthday, these came from far and near in such numbers as almost to overflow the house. No one of them ever appealed to him in vain for assistance or sympathy which it was in his power to give, while the unsolicited kindly attentions which he showed them were unfailing and very numerous. He was, indeed, the most unconsciously unselfish man I have ever known, wholly oblivious to self interest, yet ever mindful of the interests of others and seeming to regard whatever he did for them quite as a matter of course and of little or no importance, however great the service rendered. At railway stations he was habitually on hand to greet incoming or outgoing ornithological friends with grateful words of welcome or farewell and helpful acts of kindness. Whenever the American Ornithologists' Union met in Cambridge, he devoted himself to looking after the comfort and welfare of its visiting members, especially the humbler ones among them. His thoughtfulness of others, always unostentatious, was sometimes shown in rarely tactful and delicate ways. The late Howard Saunders had interesting experience of this when visiting Boston in 1884. At the close of a day spent in going about the city with Mr. Purdie, he parted with him at the State House, declining for reasons which I have forgotten to be escorted by him to Bowdoin Square, whither he walked to take a horse-car out to Cambridge. On nearing his destination and happening to glance back, he saw, at some distance to the rear, stealing along the shadowy side of the street, a dim figure which he recognized as that of Mr. Purdie, who was following him thus surreptitiously to make sure that he did not lose his way among the old 'cowpaths' of Boston, or get on the wrong car. When, years afterwards, Mr. Saunders related this incident to me in London, he wound up the story by saying very feelingly: "Of all the friends I made in America, I value most Henry Purdie."

It must not be inferred from anything which I have said or left unsaid, that Henry Purdie was devoid of worthy pride or of true

manliness. Beneath his quiet, unassuming manner lay concealed a really proud spirit and no little self-reliance and hardihood. These were manifested by his wise fastidiousness in the choice of intimate associates; by his unwillingness to accept favors which could not be repaid; by the decided opinions which he held and was quite able vigorously to defend; by his intolerance of injustice,— which, when so minded, he could rebuke with prompt and effective speech or action; by the calmness and resourcefulness with which he faced grave dangers and serious troubles — although addicted to worry and tribulation concerning lesser risks and annoyances. If he failed to achieve all the worldly success and advancement which might easily have been his had he been only a little differently constituted, it may be said of him with absolute truth that he lived a pure, honorable and very useful life, serving faithfully and acceptably, first his country; next his state; then the natural science that he loved; finally a host of friends no one of whom can ever forget the charm of his affectionate, guileless nature or cease to be thankful for the privilege of having come in close touch with it.

Although perhaps not complete the following list includes all the titles of published ornithological notes and papers written by Henry Purdie of which I have present knowledge.

1. [A letter relating to the Golden-winged Warbler.] In this letter early instances of the occurrence of the species at West Newton, Massachusetts, are reported and its habits and song rather fully described; published by E. A. Samuels, *Orn. & Oöl. of N. E.*, 1867, pp. 214, 215.

2. [Announcement of the Capture of Tennessee Warblers in Newton, Mass.] *Proc. Bos. Soc. N. H.*, Vol. XIII, 1869, p. 93.

3. Tennessee Warbler. *Am. Nat.*, Vol. III, Aug. 1869, p. 331.

4. Golden-winged Warbler. *Am. Nat.*, Vol. III, Nov. 1869, p. 497.

5. Colluris Ludovicianus. *Am. Nat.*, Vol. VII, Feb. 1873, p. 115.

6. Notes on some of the Rarer-Birds of New England. *Am. Nat.*, Vol. VII, Nov. 1873, pp. 692, 693.

7. Birds of New England. [A review, signed by initials "H. A. P.," of Dr. T. M. Brewer's 'Catalogue of the Birds of New England' published in 1875.] *Bull. Nutt. Orn. Club*, Vol. I, Sept. 1876, pp. 72, 73.

8. The Nest and Eggs of Traill's Flycatcher, as observed in Maine. *Bull. Nutt. Orn. Club*, Vol. I, Sept. 1876, p. 75.

9. Distribution of New England Birds.— A Reply to Dr. T. M. Brewer. *Bull. Nutt. Orn. Club*, Vol. II, Jan. 1877, pp. 11–17.

10. Notice of a Few Birds of Rare or Accidental Occurrence in New England. *Bull. Nutt. Orn. Club*, Vol. II, Jan. 1877, pp. 20–22.

11. The Lark-Finch (*Chondestes grammaca*) again in Massachusetts. *Bull. Nutt. Orn. Club*, Vol. III, Jan. 1878, p. 44.

12. The Black-throated Bunting (*Euspiza americana*) nesting in Massachusetts. *Bull. Nutt. Orn. Club*, Vol. III, Jan. 1878, p. 45.

13. [Letter to Linnean Society relating to nests and eggs of Traill's and Acadian Flycatchers.] *For. & Str.*, Vol. X, No. 12, Apr. 25, 1878, p. 216.

14. Trail[l]'s Flycatcher. *For. & Str.*, Vol. X, No. 14, May 9, 1878, p. 255.

15. Sennett's Notes on the Ornithology of the Lower Rio Grande, Texas. [Review signed "H. A. P."] *Bull. Nutt. Orn. Club*, Vol. III, July, 1878, pp. 144, 145.

16. Capture of the Yellow-throated Warbler in Massachusetts, and Notes on other Rare Massachusetts Birds. *Bull. Nutt. Orn. Club*, Vol. III, July, 1878, p. 146.

17. The Nest and Eggs of the Yellow-Bellied Flycatcher (*Empidonax flaviventris*). *Bull. Nutt. Orn. Club*, Vol. III, Oct. 1878, pp. 166–168.

18. The Golden-cheeked Warbler and Black-chinned Hummingbird in Texas. *Bull. Nutt. Orn. Club*, Vol. IV, Jan. 1879, p. 60.

19. The Great Carolina Wren (*Thryothorus ludovicianus*) in Connecticut. *Bull. Nutt. Orn. Club*, Vol. IV, Jan. 1879, p. 61.

20. Nesting of the Great Northern and Loggerhead Shrikes in Maine. *For. & Str.*, Vol. XII, No. 9, Apr. 3, 1879, p. 166.

21. The Loggerhead Shrike in Maine. *For. & Str.*, Vol. XII, No. 14, May 8, 1879, p. 265.

22. Record of Additional Specimens of the White-throated Warbler (*Helminthophaga leucobronchialis*). *Bull. Nutt. Orn. Club*, Vol. IV, July, 1879, pp. 184, 185.

23. Another Kirtland's Warbler (*Dendroica kirtlandi*). *Bull. Nutt. Orn. Club*, Vol. IV, July, 1879, pp. 185, 186.

24. The Loggerhead Shrike breeding in Maine. *Bull Nutt. Orn. Club*, Vol. IV, July, 1879, pp. 186, 187.

25. MacFarlane's Gerfalcon (*Falco gyrfalco sacer*) in Maine. *Bull. Nutt. Orn. Club*. Vol. IV, July, 1879, pp. 188, 189.

26. Corvus ossifragus on Long and Staten Islands, N. Y. *Bull. Nutt. Orn. Club*, Vol. V, Oct. 1880, p. 240.

27. The Purple Gallinule in New England. *Bull. Nutt. Orn. Club*, Vol. V, Oct. 1880, p. 242.

28. The Avocet (*Recurvirostra americana*) in Massachusetts. *Bull. Nutt. Orn. Club*, Vol. VI, April, 1881, p. 123.

29. Melanerpes erythrocephalus about Boston. *Bull. Nutt. Orn. Club*, Vol. VII, Jan. 1882, p. 57.

30. Ammodramus caudacutus.— A somewhat inland Record on the Atlantic Coast. *Bull. Nutt. Orn. Club*, Vol. VII, April 1882, p. 122.

31. Pelidna subarquata on the Maine Coast. *Bull. Nutt. Orn. Club*, Vol. VII, April, 1882, p. 124.

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32. Rhynchops nigra.— An early Record for the Massachusetts Coast. *Bull. Nutt. Orn. Club*, Vol. VII, April, 1882, p. 125.

33. Garzetta candidissima at Nantucket, Massachusetts. *Bull. Nutt. Orn. Club*, Vol. VII, Oct. 1882, p. 251.

34. Rare Warblers in Massachusetts. *Bull. Nutt. Orn. Club*, Vol. VII, Oct. 1882, p. 252.

35. A Flock of White Herons (*Herodias egretta*) in Eastern Massachusetts. *Bull. Nutt. Orn. Club*, Vol. VIII, Oct. 1883, pp. 242, 243.

36. An Earlier Occurrence of the Prothonotary Warbler in Massachusetts. *Auk*, Vol. III, Oct. 1886, p. 488.

SOME REMINISCENCES OF THE LATE PROFESSOR C. O. WHITMAN.

BY R. M. STRONG.

Plate II.

A PROMINENT characteristic of Professor Whitman was his success in the study of live animals. On many occasions the writer was impressed by Professor Whitman's ability to capture and handle timid doves without the frantic struggles that would occur with less skilful treatment. He was equally fortunate with other animals.

Young birds, taken from the nest, were reared with great success, and they became very tame. The accompanying picture illustrates a characteristic scene in the yard back of his house. It shows Professor Whitman standing in a pigeon cage, and was taken by the writer, October 10, 1908. The Flicker perched on the pan and feeding from Professor Whitman's hand was one of several which were being reared because of their interesting color pattern.

Professor Whitman enjoyed natural history work in the field, though in his later years he seldom felt free to leave his pigeons even for a half day in the country. One of these exceptional breaks occurred, however, on June 15, 1910, only a few months before his death. In company with a colleague and the writer, a marsh outside of Chicago where marsh birds were nesting in

unusual abundance was visited. The weather was beautiful, and Professor Whitman was in fine spirits.

A small duck boat conveyed the party to nests of Coots, Rails, Gallinules, Black Terns, etc., with eggs and young birds just hatched. These aroused keen enthusiasm.

A unique experience was an encounter with some young Pied-billed Grebes and their parents. The writer had found the nest five days before, with two downy young just hatched which were lying on the material covering the other eggs not yet hatched, as is the custom of grebes. On this later visit, we saw the parent grebes swimming with several of their offspring in open water not many rods from the now deserted nest. Professor Whitman urged a very quiet and deliberate approach. Our little boat in which we were obliged to sit with some care to avoid tipping, was gradually paddled up to within a very few rods of the grebes. As we drew near, the little grebes gathered about one of the parents and took places inside its wings. In another moment, the bird dived taking the young with her. We were able later to capture one of the little grebes for a few minutes' inspection.

NOTES ON THE SUMMER BIRDS OF THE ST. JOHN VALLEY, NEW BRUNSWICK.[1]

BY CHARLES W. TOWNSEND, M. D.

THE following observations were made between July 11 and August 4, 1911, in the lower part of the valley of the St. John River, New Brunswick, between St. John and Fredericton. Two days were spent at St. John, a day on the Kennebecasis River, eight days at Glenwood, three days at Upper Greenwich, a day at Fredericton, and nine days at Gerow's Landing, Wickham.

As one ascends the St. John River, one is struck with the sudden change in the physical character of the valley from the hilly,

[1] Read before the Nuttall Ornithological Club, October 2, 1911.

almost mountainous and forest clad shores of the southern portions, beginning close to the city of St. John and extending upwards for about thirty miles, to the more pastoral scenery where the river is bordered by a flood plain, and where the islands, instead of being rocky and forested as in the south, are low-lying mud banks on which hay in great quantities is produced. Back of this flood region the gently sloping hills are largely given up to farming, while the forest recedes to the background. The forest is chiefly spruce — white, black and red — and balsam fir, with arbor vitæ and larches in places, and an occasional white pine and hemlock. Canoe, white and yellow birches, beeches, rock maples, mountain ashes and poplars also form parts of the forest. All of these trees in the lower, wilder regions of the valley sometimes attain considerable dimensions, especially in that portion back of Glenwood and Upper Greenwich. Beginning at Glenwood, red oaks become common in the river valley, while the graceful wineglass-shaped American elm is the most conspicuous tree on the low shores and islands, and an occasional butternut and linden are to be seen.

Recent subsidences has depressed this whole region to such an extent that the former river cutting has become an estuary of the sea, the force of whose tides are felt even to Fredericton, a distance of eighty-four miles.

While the region of the city of St. John and the hills back of it are cooled by the proximity of the Bay of Fundy with its rushing tides and frequent fogs, the broad alluvial central valley has a more genial summer climate, as shown by a comparison of the mean summer temperature in Fredericton and St. John. The average of the mean temperature for the month of May in the years 1901, 1902, 1904 and 1905 was 2.4° Far. higher at Fredericton than at St. John. In June of these years it was 2.5° higher, while in July it was 5° higher in Fredericton than in St. John.

As a result of this proximity of two such unlike summer climates there is an admixture here of Boreal and Transition species. As long ago as 1869 (Am. Naturalist, Vol. III, 1869, p. 331), the late Mr. Henry A. Purdie suggested that some birds not common on the central and southern Maine coast may have reached the northern coast of Maine by the "Saint Lawrence and Maine Central

water route." Mr. O. W. Knight in his 'Birds of Maine' in speaking of the Rose-breasted Grosbeak, which he states "is rare along the coast and in certain of the central portions of the State, while north it is again locally common," says: "It seems quite probable indeed that these northern representatives of the species enter the State from the west and pass across it by some regular migration route." Montague Chamberlain, in the Bulletin of the Natural History Society of New Brunswick, No. II, 1883, p. 40, says "that many of the species of birds rarely met with in the vicinity of the coast of the Bay of Fundy during the breeding season are much more abundant at that time beyond the line across which the humidity and low temperature so characteristic of this coast at that season do not penetrate, said line being drawn some 15 or 20 miles from the shore of the Bay."

That some of these birds of the St. John valley that are less common farther south on the coast, migrate north in the interior until they reach the valley of the St. John, and follow it until they are arrested by the colder regions bordering the Bay of Fundy, seems therefore a not unlikely theory. The fact that on July 31 I saw forty-five Night Hawks flying as if in migration in a *northerly* direction over the river valley at Wickham is certainly suggestive.

The further extension of migration routes from this warm St. John Valley to the north is clearly shown in an interesting paper by Professor W. F. Ganong (Bull. Nat. History Soc. of New Brunswick, Vol. V, part iv, 1906, pp. 423–433). One of these natural migration routes extends northwest along Washademoak Lake, a great drowned side valley of the St. John River above Wickham, the Canaan and the Buctouche Rivers, Northumberland Straits, Prince Edwards Island, and Cascumpec Harbor. North of this and parallel with it is a route by way of Grand Lake, Salmon and Richibucto Rivers, while farther north the Nashwaak and Miramichi Rivers together, and the Nepisiquit and the Restigouche Rivers form three other obvious routes. Besides these, Professor Ganong has sketched numerous probable and possible valleys all extending northeast and southwest.

On the southern coast of the Labrador Peninsula, in the Mingan region, the avifauna as far east as Natashquan is largely Canadian with a sprinkling of birds of the Hudsonian zone and even of some

that are characteristic of the Alleghanian Zone,[1] while the shore to the eastward, which feels more strongly the arctic current — for icebergs float as far west as Natashquan — is the summer home of Hudsonian and Arctic birds. It is possible that the Canadian fauna reaches the Mingan region of Labrador by way of the valley of the St. Lawrence, or by the migration routes from the St. John valley just sketched, thence north across the narrow part of the Gulf of St. Lawrence over the island of Anticosti, or by both routes. Much further study is needed to elucidate these problems.

The following is a briefly annotated list of the birds observed, all of which are, I believe, summer residents.

1. **Larus argentatus.** HERRING GULL.— A few in the harbor of St. John.

2. **Sterna hirundo.** COMMON TERN.— A few in the Kennebecasis River, and on the St. John River all the way from St. John to Fredericton. At Wickham and Upper Greenwich birds were frequently seen flying down the river with small fish hanging from their bills, while the return trips were made without the fish.

3. **Phalacrocorax auritus auritus.** DOUBLE-CRESTED CORMORANT.— A single bird, apparently of this species, seen on the river about eight miles above St. John.

4. **Anas rubripes tristis.** BLACK DUCK.— A few above Upper Greenwich.

5. **Clangula clangula americana.** WHISTLER.— One seen on July 12 on the Kennebecasis.

6. **Botaurus lentiginosus.** BITTERN.— One at Queenstown, July 26.

7. **Ardea herodias herodias.** GREAT BLUE HERON.— Not uncommon on the Kennebecasis and on the St. John above Upper Greenwich.

8. **Philohela minor.** WOODCOCK.— Two seen at Glenwood, July 17.

9. **Actitis macularia.** SPOTTED SANDPIPER.— Common along the rivers and brooks.

10. **Bonasa umbellus togata.** CANADIAN RUFFED GROUSE.— Several at Glenwood and at Upper Greenwich.

11. **Zenaidura macroura carolinensis.** MOURNING DOVE.— A pair nesting in a spruce at Glenwood, July 20.

12. **Circus hudsonius.** MARSH HAWK.— One at Wickham, August 4.

13. **Accipiter velox.** SHARP-SHINNED HAWK.— One seen at Glenwood and one at Wickham.

14. **Buteo borealis borealis.** RED-TAILED HAWK.— One at Wickham.

15. **Buteo platypterus.** BROAD-WINGED HAWK.— Two were seen

[1] Townsend and Bent, Auk, XXVII, 1910, pp. 1–18.

at Glenwood circling together over the forest, uttering their clear, double, *ter-whée*.

16. **Haliæetus leucocephalus leucocephalus**. BALD EAGLE.— Several seen from Upper Greenwich to Fredericton. At the former place two or three in immature, and one in adult plumage were seen daily, and a farmer told me that a pair nested on a cliff, and that they had carried off eight of his chickens. He said that one of the young birds had seized a hen, but was unable to carry her off. The hen made such an outcry that the farmer came to her rescue and the eagle departed. At Wickham I watched an adult and young bird circling near together, and once the young turned on its side and thrust out its legs as if about to grapple with the adult.

17. **Coccyzus erythrophthalmus**. BLACK-BILLED CUCKOO.— Heard singing several times at Glenwood.

18. **Ceryle alcyon**. BELTED KINGFISHER.— Not uncommon. At Wickham I heard one practising its rattle in so low a tone that it suggested the distant trill of a wren.

19. **Dryobates villosus villosus**. HAIRY WOODPECKER.— Common.

20. **Dryobates pubescens medianus**. DOWNY WOODPECKER.— Common.

21. **Sphyrapicus varius varius**. YELLOW-BELLIED SAPSUCKER.— One seen at Hampton, July 12.

[*Melanerpes erythrocephalus*, Red-headed Woodpecker. A mounted specimen was seen in the taxidermist shop of Emack Bros. in Fredericton, and I was told that the bird was shot by the guide Tom O'Leary at Beaverdam, York County, on June 1, 1911, and brought to the taxidermist in the flesh.]

22. **Colaptes auratus luteus**. NORTHERN FLICKER.— Common.

23. **Chordeiles virginianus virginianus**. NIGHTHAWK.— Common and evidently nesting on roofs in St. John and Fredericton. On July 31, at 5.30 P. M. at Wickham, I counted 45 Nighthawks flying *north* high over the river.

24. **Chætura pelagica**. CHIMNEY SWIFT.— Abundant. At Fredericton, on July 25, I watched a large flock of Swifts enter for the night a chimney on the southwest corner of the Parliament Building. Sun set at about 8 P. M. At 8.24 P. M. one bird set its wings and dropped into the chimney and soon they began dropping in fast, while the flock circled first one way then another or crowded together in a confused mass, twittering loudly all the time. Owing to the proximity of the dome regular circling was somewhat interfered with, but as a rule the birds circled in the direction of the hands of a clock, and individuals would drop out and into the chimney in dozens when the circle passed over it. Occasionally they would all swoop off to the other side of the building, soon to return. At 8.45 P. M. practically all the birds had entered the chimney and I had counted roughly,— at first singly and later by tens,— 2200 birds. A minute later, when it was nearly dark, six stragglers appeared, five of

which entered the chimney while the sixth retired by itself to another chimney.

25. **Archilochus colubris**. RUBY-THROATED HUMMINGBIRD.— Two seen.

26. **Tyrannus tyrannus**. KINGBIRD.— One seen at Glenwood. Common at Wickham.

27. **Nuttallornis borealis**. OLIVE-SIDED FLYCATCHER.— One seen at Wickham, August 4.

28. **Myiochanes virens**. WOOD PEWEE.— One at Fredericton and one at Upper Maugerville.

29. **Empidonax flaviventris**. YELLOW-BELLIED FLYCATCHER.— Common at Glenwood.

30. **Empidonax trailli alnorum**. ALDER FLYCATCHER.— A few at Glenwood and Wickham, in full song.

31. **Cyanocitta cristata cristata**. BLUE JAY.— A few seen.

32. **Corvus brachyrhynchos brachyrhynchos**. CROW.— Common.

33. **Dolichonyx oryzivorus**. BOBOLINK.— Abundant in river meadows at Wickham, not singing; a flock of thirty or forty.

34. **Agelaius phœniceus phœniceus**. RED-WINGED BLACKBIRD.— Common in the meadows of the Kennebecasis River and on the St. John above Upper Greenwich.

35. **Quiscalus quiscula æneus**. BRONZED GRACKLE.— Common.

36. **Carpodacus purpureus purpureus**. PURPLE FINCH.— Abundant.

37. **Loxia curvirostra minor**. RED CROSSBILL.— A small flock seen at Glenwood on July 15.

38. **Loxia leucoptera**. WHITE-WINGED CROSSBILL.— Eight or ten seen at Glenwood on July 20.

39. **Astragalinus tristis tristis**. GOLDFINCH.— Abundant.

40. **Passer domesticus**. ENGLISH SPARROW.— Abundant in cities and larger settlements. Although they were common in the village of Wickham, there were none three miles away at Gerow's landing. This fact probably accounted for the successful broods of turkeys raised at the latter place, as they were not infected by the Sparrows with the blackhead disease.

41. **Spinus pinus pinus**. PINE SISKIN.— A flock of six seen at Glenwood on July 16 and 17.

42. **Pocœcetes gramineus gramineus**. VESPER SPARROW.— Common at Wickham. Not seen elsewhere.

43. **Passerculus sandwichensis savanna**. SAVANNAH SPARROW.— Abundant.

44. **Passerherbulus nelsoni subvirgatus**. ACADIAN SHARP-TAILED SPARROW.— Very abundant in the meadows of the St. John at upper Greenwich, Wickham and Hampstead. The A. O. U. Check-list states of this bird that it is found in the "Salt marshes of the Atlantic coast," although Dwight (Auk, XXII, 1896, p. 276) speaks of it as "peculiar to

the fresh and salt water marshes of the maritime Provinces of Canada." These marshes where I found it were made up entirely of fresh water vegetation including arrow heads and white pond lilies, although the impulse of the tides is felt there. The curious song of this bird, which resembles closely the hiss of hot iron in water followed usually by two short low notes, was heard on every hand in these meadows during my visit there from July 21 to August 4. Occasionally a bird would indulge in a flight song, uttering short notes as he flew up, followed by rapid repetitions of his simple song during the descent to the grass where he continued to sing. One repeated his song in the grass ten times in a minute. A female that was taken contained eggs, evidently of the second brood, for full grown young were common. These were in the juvenal dress which resembles in general coloration that of the juvenal Bobolink, although of course the finches are much smaller. A juvenal specimen obtained was easily distinguished from the juvenal *caudacutus*. In the latter the markings on the sides of the chest are distinct, in the former indistinct and few.

45. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.— Abundant and in full song. At Glenwood on July 15 when the sun set at 7.49 these birds sang until 9 P. M. when it was too dark to see to read.

46. **Spizella passerina passerina.** CHIPPING SPARROW.— Abundant.

47. **Junco hyemalis hyemalis.** SLATE-COLORED JUNCO.— Abundant.

48. **Melospiza melodia melodia.** SONG SPARROW.— Abundant.

49. **Melospiza georgiana.** SWAMP SPARROW.— Common at Hampton and Wickham.

50. **Progne subis subis.** PURPLE MARTIN.— Fifteen or twenty pairs were nesting in the iron framework of the bridge at Hampton over the Kennebecasis River. English Sparrows were constantly fighting with them. At Brown's flat I noticed several Martin houses inhabited only by English Sparrows, and was told that the Martins had been entirely driven out by these pests. At Evandale were several small houses inhabited by Martins; no English Sparrows were to be seen. At Fredericton and at Wickham Martins were frequently seen.

51. **Petrochelidon lunifrons lunifrons.** CLIFF SWALLOW.— Abundant. At Glenwood I counted sixty-five nests on one barn and shed.

52. **Hirundo erythrogastra.** BARN SWALLOW.— Common.

53. **Iridoprocne bicolor.** TREE SWALLOW.— Common.

54. **Riparia riparia.** BANK SWALLOW.— A few seen.

55. **Bombycilla cedrorum.** CEDAR WAXWING.— Common.

56. **Vireosylva olivacea.** RED-EYED VIREO.— Abundant.

57. **Lanivireo solitarius solitarius.** BLUE-HEADED VIREO.— Common.

58. **Mniotilta varia.** BLACK AND WHITE WARBLER.— Common.

59. **Vermivora rubricapilla rubricapilla.** NASHVILLE WARBLER.— Abundant, in full song.

60. **Compsothlypis americana usneæ**. NORTHERN PARULA WARBLER.— Abundant, in full song.

61. **Dendroica æstiva æstiva**. YELLOW WARBLER.— Not uncommon.

62. **Dendroica cærulescens cærulescens**. BLACK-THROATED BLUE WARBLER.— One at Glenwood, July 14.

63. **Dendroica coronata**. MYRTLE WARBLER.— Common and in song.

64. **Dendroica magnolia**. MAGNOLIA WARBLER.— Abundant, in full song.

65. **Dendroica castanea.** BAY-BREASTED WARBLER.— Common. At Glenwood, Upper Greenwich and at Wickham I saw one or two nearly every day and twice heard the male sing. At the two last named places I saw them feeding fully grown young.

66. **Dendroica virens**. BLACK-THROATED GREEN WARBLER.— Common and in song.

67. **Seiurus aurocapillus**. OVEN-BIRD.— Two or three heard singing at Glenwood, and one seen giving his flight song. One seen with young at Wickham on August 2.

68. **Geothlypis trichas trichas**. MARYLAND YELLOW-THROAT.— Common, in song.

69. **Wilsonia canadensis**. CANADA WARBLER.— One seen at Glenwood on July 14.

70. **Setophaga ruticilla.** REDSTART.— Rather common.

71. **Nannus hiemalis hiemalis**. WINTER WREN.— Common and in song.

72. **Certhia familiaris americana.** BROWN CREEPER.— A few seen at Glenwood.

73. **Sitta canadensis**. RED-BREASTED NUTHATCH.— One at Wickham, August 3 and 4.

74. **Penthestes atricapillus atricapillus.** CHICKADEE.— Abundant.

75. **Penthestes hudsonicus hudsonicus.** HUDSONIAN CHICKADEE. — Nearly as common as *P. atricapillus*. On one occasion only, at Glenwood on July 15, I heard the clear warbling notes of this species.

76. **Regulus satrapa.** GOLDEN-CROWNED KINGLET.— Abundant.

77. **Hylocichla fuscescens fuscescens**. VEERY.— Two were frequently heard singing at Glenwood in a thicket by the river, and one by Jones's Creek.

78. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.— Abundant and in full song, especially at Glenwood from July 13 to July 21.

79. **Hylocichla guttata pallasi**. HERMIT THRUSH.— Abundant and in full song.

80. **Planesticus migratorius migratorius**. ROBIN.— Abundant.

81. **Sialia sialis sialis.** BLUEBIRD.— The only Bluebirds I saw were a pair in the fields at Jones's Creek, Glenwood, about two miles from its mouth at the St. John River. This was on July 15.

A NAME FOR THE HAWAIIAN LINNET.

BY J. GRINNELL.

IN THE University of California Publications in Zoölogy, Volume 7, February, 1911, pages 179–195, the fact was recorded that the Linnet of the Hawaiian Islands at the present time differs conspicuously from the Linnet of California in that the males are yellow or orange, instead of red. It was further shown that in all probability the Hawaiian stock was introduced from California less than forty years ago.

While, as shown in the paper cited, I recognize the fact that occasional examples from different parts of the range of *Carpodacus frontalis* show the same characters as the Hawaiian birds (as do also cage-birds), this does not at all mean that these aberrant examples are of the same immediately genetic stock; in fact, because of remoteness of locality, they are obviously not closely related. In the former case the feature is sporadic, in the latter constant and peculiar to a distinct geographic area. No matter how recently this feature of the Linnet of the Hawaiian Islands may have been acquired, or by what one of various complex processes, the apparent fact remains: the peculiarity of the present day Hawaiian Linnet is specific. To meet the requirement of systematic zoölogy, a name should therefore be provided for it, which I herewith do:

Carpodacus mutans, new species.

HAWAIIAN LINNET.

TYPE, male adult; no. 12611, Univ. Calif. Mus. Vert. Zoöl.; Haiku, Maui, Hawaiian Territory; February 22, 1910; collected by Annie M. Alexander; orig. no. 465, A. M. A.

DIAGNOSIS. — Closely similar to *Carpodacus frontalis* as occurring in the San Francisco Bay region of California; but crimson areas in males of *frontalis*, yellow or orange in males of *mutans*.

DESCRIPTION OF TYPE. — Rump, continuous frontal, supra-ocular and supra-auricular area, throat, malar region and chest, deep chrome; top of head, nape and breast washed with same; on forehead the color intensi-

fied towards orange; elsewhere dorsally, hair brown, with centers of exposed ends of feathers darkest; wings and tail dark hair brown with pale edgings; lower breast, sides, flanks and crissum, with narrow shaft-streaks of hair brown on a dull whitish ground; streaks on flanks and crissum broadest, narrowest on belly; maxilla, feet and legs dark hair brown; mandible pale hair brown. Wing, 79 mm.; tail, 58.7; tarsus, 17; hind toe with claw, 12; culmen, 10.3; bill-from-nostril, 8.2; gonys, 7.5; width of maxillary portion of bill at base, 7.1; depth of bill (normally closed) through nostril from proximal end of culmen to symphesial portion of mandibular ramus, 8.3.

RANGE. — Specimens are at hand from the islands of Oahu, Molokai, and Maui, H. T. The linnet has been reported also from Hawaii and Kaui.

A LIST OF THE BIRDS OF SEDGWICK COUNTY, KANSAS.

BY DWIGHT ISELY.

INTRODUCTION.

THE following paper was originally written as a summary of my observations on the habits of birds in the vicinity of Fairmount College, Wichita, Kansas, during the school year 1909–10. The work was done in connection with a course in animal ecology taken under the instruction of Austin P. Larrabee, Professor of Biology at Fairmount College.

In my observations I intended in the first place to become familiar with as many species and their habits as possible. In particular I aimed to study their migration habits and to determine the favorite environment of each bird.

Since the paper was first written I have endeavored to make as nearly as possible a complete list of the birds of Sedgwick County. With this in view I made a compilation not only of all I had noted regarding birds in my five years' residence in Wichita but also I secured records of Professor Austin P. Larrabee, Dr. R. Mathews, and Messrs. Richard H. Sullivan and Charles H. Smyth.

Professor Larrabee, head of the department of biology at Fairmount College, has lived in Wichita since September, 1909, and has kept complete notes on bird migrations since that time. Dr. Mathews has observed birds in Sedgwick County for 25 years. The late Dr. F. H. Snow of the University of Kansas has credited him with three species in his 'Catalogue of the Birds of Kansas.' Mr. Sullivan, the local weather forcaster, is president of the Kansas Audubon Society. He has kept very complete notes on bird migrations since 1905. Mr. Smyth is president of the Wichita Sportsmen's Club and has in his keeping the club records in which all the ducks shot on its reserve since 1889 are noted. To these gentlemen I am greatly indebted for the assistance they have given me.

The center of the field of my observations has been Fairmount Hill and Fairmount College campus. Fairmount Hill is a suburb of Wichita, northeast of the main part of the city, and connected with it only by a few scattering houses. Trees, mostly elms and maples, are planted along the streets and on the lawns, and there are a few small orchards. There is little shrubbery on the Hill and it is not as thickly settled as the city proper. On the college campus is a grove of maples, elms and ash trees and the so-called cedar (*Juniperus virginianus*) and a clump of cottonwoods. For the most part the trees are still small.

South of Fairmount Hill is a cemetery covering about 100 acres, planted with a mixed grove of maple, elm, coffee bean, red-bud, cedar and spruce trees. The evergreen and deciduous trees are evenly divided. In the east part of the cemetery is a pond covering several acres. About half of it is very shallow. Its banks are fringed with willows, sedges and swamp grasses.

East and north of Fairmount Hill is for the most part prairie land. A few osage oranges check these meadows. About three fourths of a mile east of Fairmount Hill is a shallow pond, known as the Reed Pond, whose borders are overgrown with cat-tails, bulrushes, willows and swamp grasses. Leading from this pond in a southerly direction is a slough which in the rainy season forms a chain of little ponds. About a mile northeast of Fairmount College is McGuinnis's Pond, which covers several acres. Leading from this pond in a northerly direction is a slough which also

forms a series of little ponds in the rainy seasons. Immediately west of the Hill is unbroken prairie land, alfalfa fields, and a few houses.

About a mile and a half north of the college is Chisolm Creek, a small sluggish stream, flowing in a westerly direction. Along the creek in this region shrubbery and a few willow and elm trees are found. At a point about two miles northwest of the Hill, Chisolm Creek turns south and flows through McKinley Park, a mile and a half west of Fairmount, which is quite well wooded. Adjoining McKinley Park is a timber lot in which there is much underbrush, and on its border is a patch of raspberries and blackberries.

The Little Arkansas River, about three miles west of Fairmount Hill, flows south through Riverside Park, which covers about 100 acres. Native timber of elms, hackberries, a few oaks and black walnuts covers the entire area but in no place is it very thick. There is some underbrush along the river on land adjoining the park.

About five miles south of the city is a timber lot of about 40 acres on the Arkansas River. This is covered with tall timber of cottonwoods, sycamores, oaks, elms, black walnuts, willows and considerable underbrush, and is the only real wooded area in the territory that was under my observation.

The majority of my field trips were to the cemetery and the adjoining prairie land. About once a month I visited the Little Arkansas River. I made two trips to the woods on the Arkansas River south of the city spending nearly a half day in each case. These trips were made April 3 and April 18.

On Oct. 24 and Oct. 25, 1909, I visited Mt. Hope, a town 25 miles northwest of Wichita. On both days I made trips along the Arkansas River near there, which is fringed with plum thickets and occasionally cottonwood trees. On the last day I visited a gun club reserve, several ponds and a prairie dog town.

Dr. Mathews and Mr. Sullivan made most of their field trips in Riverside Park and along the Little Arkansas River north of Wichita. Dr. Mathews and Mr. Smyth both hunted waterfowl on the reserve of the Wichita Sportsmen's Club four miles northeast of Mt. Hope, in the extreme northwestern portion of the county. Professor Larrabee's field of observation was nearly the same as my own.

LIST OF SPECIES.

Residents.

1. **Colinus virginianus**. BOB-WHITE.— Noted 14 times between September, 1909, and June, 1910. Most often it was seen in or near a willow copse by the cemetery. The call of the male may be frequently heard in the fields in the spring and early summer.

2. **Tympanuchus americanus**. PRAIRIE HEN.— Noted by Dr. Mathews as formerly very abundant. It has not been seen for years.

3. **Meleagris gallopavo silvestris.** WILD TURKEY.— Noted by Dr. Mathews as formerly frequent.

4. **Zenaidura macroura carolinensis.** MOURNING DOVE.— Abundant. Between April and October I have noted this species nearly every day. It is very rare in winter. Doves return in large numbers about March 15 and most of them disappear by November. In the latter part of September, 1909, I noted Mourning Doves collected in flocks of hundreds along Chisolm Creek north of Fairmount where there are but few trees along its banks.

5. **Speotyto cunicularia hypogæa.** BURROWING OWL.— One bird noted near a prairie dog town near Mt. Hope, Oct. 24, 1909.

6. **Megascops asio.** SCREECH OWL.— This species may be heard on Fairmount Hill about once in two weeks. On several occasions when I have passed through McKinley Park after nightfall I have always heard its call. On the night of May 27, 1910, I turned aside from the road and entered the park, being attracted by the calls of Screech Owls. I noted eight birds in a group, most of them young.

7. **Dryobates villosus.** HAIRY WOODPECKER.— Noted only a few times a year, in McKinley and Riverside parks. Rare.

8. **Dryobates pubescens**. SOUTHERN DOWNY WOODPECKER.— Common resident in parks and along the streets of the city in the maple trees. It is occasionally noted on Fairmount Hill. Between September, 1909, and June, 1910, I noted the species every week but two.

9. **Colaptes auratus luteus.** NORTHERN FLICKER.— Common in summer in groves and hedges. Rare in winter. Most of this species leave about Oct. 1 and return about March 15. Between these dates in 1909–10, I noted the species five times. The Flicker feeds on the ground much more than any of the other woodpeckers.

10. **Corvus corax.** AMERICAN RAVEN.— Noted by Dr. Mathews as resident in the early days.

11. **Corvus brachyrhynchos.** CROW.— Uncommon on Fairmount. Abundant in fall and winter along the Arkansas River. I have noted crows in the business part of the city picking at garbage in cans back of restaurants.

12. **Agelaius phœniceus.** RED-WINGED BLACKBIRD.— Abundant except during the winter. A few young and females stay throughout

the winter. I noted a flock of males on Feb. 21, 1910, singing. The sexes did not associate with each other till the last of April. The latest date upon which I have noted males was Oct. 25, 1910. On May 20, 1910, I found 3 nests in willows by Reed Pond. The average height was 4 feet above the water. I have found the species most numerous around ponds, especially Reed Pond east of Fairmount.

13. **Sturnella magna.** MEADOWLARK.— Abundant in fields and prairies except during December and January when it becomes uncommon. Only once have I found this bird away from the open. That was during a severe snowstorm Nov. 29, 1909, when I found several Meadowlarks taking refuge in cedar trees. In 1910 the spring song began in full force about March 1 although heard as early as January 21.

14. **Sturnella neglecta.** WESTERN MEADOWLARK.— The only time that I saw this bird to identify it was April 28, 1910. Professor Larrabee identified two birds shot Jan. 4, 1911. I have heard its song at different times throughout the spring and summer.

15. **Quiscalus quiscula æneus.** BRONZED GRACKLE.— A very abundant summer resident in woods and fields. I have noted a few in every month of the year. It becomes abundant by the middle of March and continues so until the last of October. In the latter part of August and throughout September immense flocks collect and roost in the trees in Wichita. Mr. Sullivan has estimated their numbers to be more than 100,000. Many nest within the city.

16. **Astragalinus tristis.** GOLDFINCH.— Common on Fairmount Hill and in the cemetery. Except during the first week of April I have noted Goldfinches at least once a week between September, 1909 and June, 1910. The earliest date, a male in summer plumage, was April 8; the latest, Oct. 8. I always saw them in small flocks.

17. **Passer domesticus.** HOUSE SPARROW.— Very abundant in the city and around farm houses. Nests everywhere in the city in trees and under the eaves of houses.

18. **Cardinalis cardinalis.** CARDINAL.— Common resident. I have noted this species at least once every week between September, 1909, and June, 1910. The largest number observed on any one day was 38, on Feb. 10. They were in a double osage orange hedge, about 300 yards long, near Chisolm Creek. The Cardinal's mating song is first heard about Jan. 1. In March and April it is one of the most conspicuous songsters. In Brown County, Kansas, several years ago, I found the Cardinal nesting abundantly. All the nests were in gooseberry bushes, a few feet from the ground, and were lined with red rootlets.

19. **Mimus polyglottos.** MOCKINGBIRD.— Abundant in spring and summer on Fairmount Hill and in the cemetery. Rare in winter. I noted this species three times during the winter of 1909–10. Beginning with March, 1910, the species became numerous. In 1909 it was quite common until Oct. 20. In winter I have noted this bird only near cedar trees in the cemetery. I have seen it feeding upon cedar berries.

Every May for three years I have noted a nest in a mock orange bush in a neighbor's yard. In May, 1910, I noted a nest in a mulberry tree, on Fairmount Hill, about 10 feet above the ground.

20. **Thryothorus ludovicianus.** CAROLINA WREN.— Noted one bird Feb. 13, 1910, loudly singing in a brush pile by Chisolm Creek in McKinley Park. On March 19 and on April 7, I noted a pair in the same place. On April 16 I noted a pair in a plum thicket along the Little Arkansas River near Riverside Park. Several were seen in Riverside Park in March, 1908.

21. **Penthestes atricapillus.** CHICKADEE.— Numerous in woods along rivers. Around Fairmount I occasionally saw Chickadees but never in flocks. One nest was noted in a cottonwood stub near the Arkansas River, south of the city, April 18. I first noted the spring song in 1910, about Feb. 1.

22. **Planesticus migratorius.** ROBIN.— Abundant except during the latter part of December and the whole of January. Between Sept. 8, 1909, and June 1, 1910, there was not a week in which I did not observe this species. With exception of the two winter months mentioned I saw Robins nearly every day. Cedar trees in the cemetery were their particular refuge in winter. They are gregarious until March 1. About this time they begin the spring song which continues until about May 1.

23. **Sialia sialia.** BLUEBIRD.— Common in the cemetery and in Riverside Park. I have never noted it in winter but it has been seen there both by Mr. Sullivan and Professor Larrabee. The latest date I have noted it is Nov. 16; earliest date, March 1. They apparently begin singing in the spring immediately after their arrival

Summer Residents.

24. **Botaurus lentiginosus.** BITTERN.— I noted a pair of these birds during April and May, 1910, at Reed Pond, east of Fairmount. The earliest date was April 12. During the summer of 1909 a pair were occasionally seen at the same place. On Oct. 18, I saw one wading in Chisolm Creek north of Fairmount.

25. **Ixobrychus exilis.** LEAST BITTERN.— Professor Larrabee identified two of this species, April 30 and May 18. Both were found with their necks broken, on the ground beneath telephone wires. Apparently they had flown into the wires at night. I noted a Least Bittern at the Reed Pond, June 4 and June 11.

26. **Butorides virescens.** GREEN HERON.— Common at ponds and along Chisolm Creek, north of Fairmount, from May to October. First date noted in 1910, May 3.

27. **Rallus elegans.** KING RAIL.— On April 19, I noted one by the Reed Pond. On June 2, I found a rail, dead, by the same pond. It had probably been killed by a hail-storm of the night before. Dr. Mathews noted that the King Rail nests here.

28. **Porzana carolina.** SORA.— I noted one by the cemetery pond Sept. 12, 1909. Professor Larrabee noted a pair May 19 by the Reed Pond. I have seen the Sora four times in four years, by the Reed Pond, in the summer.

29. **Fulica americana.** AMERICAN COOT.— Occasionally noted on ponds during the summer. Earliest date, April 16, 1910. Noted by Dr. Mathews as abundant in migration.

30. **Bartramia longicauda.** UPLAND PLOVER.— Rare in summer; common in migration. I noted a flock of several hundred May 8, 1910, on an alfalfa field northeast of Fairmount. The greater number migrate southward in September. Professor Larrabee noted one Oct. 3, 1910.

31. **Actitis macularia.** SPOTTED SANDPIPER.— Seen a few times in July, August and September, 1909. Last noted Sept. 20, wading in shallow water in the Little Arkansas River. Noted frequently in the summer by Mr. Sullivan.

32. **Oxyechus vociferus.** KILLDEER.— Common in fields and meadows. The earliest date on which I have noted this species is Feb. 14, 1911. During the first month or six weeks after their arrival Killdeers seem to spend a large part of their time in courtship. The male will fly back and forth over a field giving its cry sometimes for over an hour without intermission. After this period they are less noisy and conspicuous. A Killdeer has been noted as late as Nov. 10, 1910, by Professor Larrabee.

33. **Cathartes aura septentrionalis.** TURKEY VULTURE.— Noted a few times every summer. I saw it as late as Nov. 23 in 1909, and as early as Feb. 25 in 1910.

34. **Buteo borealis krideri.** KRIDER'S HAWK.— Rare. This bird I have seldom noted near the city. The earliest date is April 18; the latest, Oct. 8, 1909.

35. **Aluco pratincola.** BARN OWL.— One pair noted by Dr. Mathews, nesting. Noted by Mr. Sullivan in May, August and October.

36. **Coccyzus americanus.** YELLOW-BILLED CUCKOO.— A common summer resident. I have noted it before June 1 or after September 1. I have found it almost anywhere where there are trees.

37. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO.— Dr. Mathews has found one Black-billed Cuckoo's nest.

38. **Ceryle alcyon.** BELTED KINGFISHER.— Uncommon. April 16 is the earliest date upon which I have noted it. It may be seen throughout the summer along the Little Arkansas River, and I have noted it on Chisolm Creek.

39. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— A common resident of Riverside Park and of the trees along the city streets. This bird seems to be more fond of telephone poles and dead trees than any other of the woodpeckers. Noted as early as April 8 by Mr. Sullivan. My latest date is Sept. 23 in 1909.

40. **Centurus carolinus.** RED-BELLIED WOODPECKER.— Noted

April 7, and May 20, 1910, in McKinley Park. Dr. Mathews found a pair nesting near the city in the summer of 1902.

41. **Antrostomus vociferus.** WHIP-POOR-WILL.— Noted by Dr. Mathews as seen occasionally in summer.

42. **Chordeiles virginianus.** NIGHTHAWK.— Common in summer; abundant during September migration. First noted in 1910, May 8. Last noted in 1909, Oct. 12.

43. **Chætura pelagica.** CHIMNEY SWIFT.— Common in the city. First noted in 1910, May 9; last noted in 1909, October 12. Many of them roost in the unused chimneys on Fairmount college.

44. **Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.— Rare. I see it a few times during a summer.

45. **Muscivora forficata.** SCISSOR-TAILED FLYCATCHER.— Noted one bird June 22, 1907. Dr. Mathews notes this species as rare but increasing. It is said by Garner Taylor to be quite common a few miles south of Wichita.

46. **Tyrannus tyrannus.** KINGBIRD.— Common in groves and along fences. In 1910 the first date on which I noted the species was April 30. The last date in 1909 was Sept. 15. Kingbirds decrease in numbers in August.

47. **Myiarchus crinitus.** CRESTED FLYCATCHER.— Common in the tree-tops of Riverside Park throughout the early summer. The earliest date on which I have noted this species is May 1, in 1910.

48. **Sayornis phœbe.** PHŒBE.— Common by bridges, under which I have noted several nests. In Brown County, Kansas, I once found a nest in a cattle barn. Two sets of eggs were laid in it but both were destroyed and at last the nest was abandoned by the Phœbes. It was immediately occupied by English Sparrows when the first owners left it. The Phœbe disappears early in the summer. The earliest date upon which I have noted it is March 4, 1910.

49. **Myiochanes virens**. WOOD PEWEE.— Common throughout the summer in Riverside Park. It continues its song later into the summer than do most birds. Mr. Sullivan has noted it as early as March 17; his latest date is September 11.

50. **Empidonax virescens.** ACADIAN FLYCATCHER.— Dr. Mathews saw a pair building a nest in Riverside Park in the summer of 1902.

51. **Cyanocitta cristata.** BLUE JAY.— Abundant in Riverside Park; common on Fairmount Hill and in the cemetery. First noted on April 16 in 1910. It was common in the fall of 1909 until October and was last noted on the 12th of that month.

52. **Molothrus ater.** COWBIRD.— Common in spring and summer and abundant in fall. The earliest date upon which I noted this species was March 16 in 1910. In the fall of 1909 I saw it as late as Nov. 15. Like the Grackles the Cowbird follows the plow in spring and feeds upon grubs.

53. **Icterus spurius.** ORCHARD ORIOLE.— Common in the trees

along the streets, in the cemetery and in Riverside Park. The earliest date upon which I have noted this species was May 8, in 1910. They begin to be less numerous about Aug. 1.

54. **Icterus galbula.** BALTIMORE ORIOLE.— A common tree bird along the city streets, in the cemetery and Riverside Park. The first date upon which I have noted this species was April 30, in 1910. It becomes rare about two weeks later than the Orchard Oriole. I have often seen this bird robbing the pea patch in the garden.

55. **Passerherbulus lecontei.** LECONTE'S SPARROW.— A very common prairie bird. The earliest date, March 28, in 1910. The species is quite conspicuous in the early part of the summer when its cricket-like song can be heard on the prairie, especially at twilight. It was noted as late as Oct. 3 by Professor Larrabee, in 1910.

56. **Chondestes grammacus.** LARK SPARROW.— A common prairie bird often found near ponds. It was first noted April 4 in 1910, and last seen Oct. 8 in 1909.

57. **Spizella passerina.** CHIPPING SPARROW.— Uncommon on Fairmount Hill and in the cemetery. Noted first May 4 in 1910. I see this species a few times every summer.

58. **Spizella pusilla.** FIELD SPARROW.— I have seen this bird a few times in the cemetery and in the open woods in Riverside Park. The earliest date is March 27, 1910. In Brown County, Kansas, where the species was abundant, the hedges were a favorite cover at night. The Field Sparrow there had a habit of singing at any time of the night.

59. **Pipilo erythrophthalmus.** TOWHEE.— Common in April and May in the underbrush by the Little Arkansas River. First noted, a pair, April 7, 1910, in McKinley Park. The latest I have seen this species is Oct. 25, 1909.

60. **Zamelodia ludoviciana.** ROSE-BREASTED GROSBEAK.— Rare. Noted four times in four years, in Riverside Park, where Dr. Mathews found it nesting in the summer of 1902.

61. **Passerina cyanea.** INDIGO BUNTING.— Uncommon. Noted occasionally in the tall timber in Riverside Park and McKinley Park. The earliest date, May 1, 1910.

62. **Spiza americana.** DICKCISSEL.— Abundant on the prairies during the spring and summer. During the hottest summer days these birds are very conspicuous on the tall prairie weeds, and on the fences and telephone wires, singing. They begin to be less numerous by August. The earliest date of arrival noted was May 8, in 1910. The latest seen was Sept. 25, 1909. The Dickcissel is very fond of water, and I have often noted it wading in shallow ponds.

63. **Piranga erythromelas.** SCARLET TANAGER.— Noted July 1, 1909, in Riverside Park. Three have been noted at different times by Dr. Mathews.

64. **Progne subis.** PURPLE MARTIN.— Common in the business part of the city, where several hundred pairs nest every summer. The earliest

date on which I have noted it was March 24 in 1910. Mr. Sullivan has noted Martins as early as March 11. They begin to migrate southward by August 1.

65. **Petrochelidon lunifrons.** CLIFF SWALLOW.— Common. Noted between May 1 and September 22. In the early part of September, both of 1907 and 1908, I saw a continuous stream of these birds flying southward. They did not move in a compact flock like Blackbirds but were scattered form horizon to horizon, and were several days in passing.

66. **Hirundo erythrogastra.** BARN SWALLOW.— Common from the latter part of April until the middle of September. These birds are seen most frequently flying over ponds or around cattle. I have found a number of nests in a hay shed on the prairie east of Fairmount.

67. **Iridoprocne bicolor.** TREE SWALLOW.— Dr. Mathews has noted two pairs nesting in the city.

68. **Riparia riparia.** BANK SWALLOW.— Noted by Mr. Sullivan during the summers of 1908 and 1909. Also by Dr. Mathews.

6. **Lanius ludovicianus excubitorides.** WHITE-RUMPED SHRIKE.— Common. Noted most frequently on fences or trees in the open. The earliest date on which I have seen it was Feb. 28; the latest, Sept. 26. On May 17 I found a nest containing six eggs on the Fairmount College campus in an elm sapling, about eight feet from the ground.

70. **Vireosylva olivacea.** RED-EYED VIREO.— A common summer resident, singing in the trees along the city streets. It is one of the most persistent songsters during the hot weather, keeping up its song even into August. The earliest date upon which it was noted was May 8, by Professor Larrabee.

71. **Vireosylva gilva.** WARBLING VIREO.— A common singer in the trees along the street and in the cemetery during the first half of May. The species becomes less common during the latter part of spring and I have never noted it after July.

72. **Vireo griseus.** WHITE-EYED VIREO.— Uncommon. I have found this species most frequently along hedges and in evergreen trees. The earliest date, May 11, in 1910; the latest, Sept. 12, in 1909.

73. **Dendroica æstiva.** YELLOW WARBLER.— Abundant during the spring migration and common throughout the summer. I have found this species in trees along the streets, in the cemetery and parks. May 1, 1910, is the earliest date upon which I have noted the species.

74. **Geothlypis trichas occidentalis.** WESTERN YELLOW-THROAT.— A common bush bird in spring and early summer. The earliest date on which I noted this species was May 1, 1910. Noted in underbrush, by cemetery Pond, Chisolm Creek and Little Arkansas River. During May and June it sings almost constantly.

75. **Icteria virens.** YELLOW-BREASTED CHAT.— Noted by Dr. Mathews as common.

76. **Dumetella carolinensis.** CATBIRD.— Common in spring. The earliest date on which I have noted the species was May 8, 1910; the latest

was Oct. 3, 1909. On May 24, 1910, I found a nest with four eggs, in a dwarfed cedar tree in the cemetery, about 2 feet from the ground. The Catbird is most numerous in the underbrush along the Little Arkansas River. Throughout May and June they are among the most noticeable songsters. Later in the summer and in the fall I have heard their song from a thicket but it was very quiet, and the birds were very shy.

77. **Toxostoma rufum.** BROWN THRASHER.— Abundant from May 1 to Oct. 1. The earliest date on which I noted this species was April 12, in 1910; the latest was Oct. 9, in 1909. This bird is found in large numbers all over the city, and in the parks. Its nests are very abundant in osage orange hedges. In May and June the old birds, followed by the young, may be seen on the lawns everywhere, pulling worms out of the ground. They feed also in the fields and a few follow the plow.

78. **Thryomanes bewickii cryptus.** TEXAS BEWICK'S WREN.— One bird noted May 17, 1910, in an orchard on Fairmount Hill. This bird was singing. During the first two weeks of May, 1909, a pair of these birds sang around a neighbor's house and started to build a nest in a bird box. They were apparently driven away by a House Wren.

79. **Telmatodytes palustris.** LONG-BILLED MARSH WREN.— Noted by Dr. Mathews as frequent.

80. **Hylocichla mustelina.** WOOD THRUSH.— Common in the cemetery and the parks. Arrive about the middle of May. The last date I noted this species in 1909 was Sept. 20. After Aug. 1, the species becomes very shy and rare. On May 19, 1910, I found a nest in a peach tree about six feet above the ground, in an orchard on Fairmount Hill.

Winter Sojourners.

81. **Circus hudsonius.** MARSH HAWK.— Common. Noted about once a week from Oct. 9, 1909, until April 1, 1910, flying low over the prairies east and north of Fairmount.

82. **Buteo borealis.** RED-TAILED HAWK.— A pair has stayed in a pasture near Chisolm Creek, north of Fairmount, for several winters. In 1909 they were first noted Oct. 3, and were last seen March 16, 1910. A few scattering trees furnish perches for them.

83. **Buteo swainsoni.** SWAINSON'S HAWK.— Noted only occasionally during the winter, near the timber along the rivers. Sometimes I have seen them in flocks of 15 to 20. Mr. Sullivan noted a flock of these hawks, numbering 271, Oct. 1, 1909.

84. **Falco sparverius.** SPARROW HAWK.— Common. Noted along fences in the open and often in the city. In the fall of 1909 it was first seen Oct. 12; last noted in the spring of 1910, April 28.

85. **Sphyrapicus varius nuchalis.** RED-NAPED SAPSUCKER.— Noted by Mr. Sullivan, Dec. 23, 1910, and by Mr. Sullivan and Professor Larrabee, Feb. 10, 1911. On both occasions the species was seen in the woods along the Little Arkansas River, north of Wichita.

86. **Colaptes cafer collaris.** RED-SHAFTED FLICKER.— Noted one bird Feb. 18, 1910; noted another Dec. 17, 1910, and a pair Feb. 3, 1911. Noted also by Mr. Sullivan and Professor Larrabee.

87. **Otocoris alpestris leucolæma.** DESERT HORNED LARK.— Common. During snow storms it is abundant, coming in flocks of hundreds. In 1909 I noted them as early as Sept. 25. The following spring they became rare during the first part of April, although I noted one bird as late as May 8. Most frequently found along open ravines north and east of Fairmount. Sometimes I have seen a Horned Lark sitting on a post to sing but never on a wire or in a tree. I do not believe that their feet can grasp a round object. The Horned Lark is one of our earliest singers, beginning about the middle of January. From that time until they migrate northward their song can be heard nearly every evening on the prairie. In Brown County, Kansas, where the Horned Lark is resident, twice I found nests on crests of corn ridges. They were mere hollows in the earth with no lining. Each nest contained five eggs.

88. **Spinus pinus.** PINE SISKIN.— Abundant in cedar trees in the cemetery, during the winters of 1906–07, 1907–08, 1908–09. I have not seen these birds since. Professor Larrabee noted a small flock in the cemetery March 9, 1911.

89. **Zonotrichia querula.** HARRIS'S SPARROW.— An abundant bush bird, very abundant during the spring migration. The first date upon which I noted the species in the fall of 1909 was Oct. 13. The following spring the last were noted May 14. Harris's Sparrows become abundant by Oct. 25. During March and April I believe that they are the most numerous birds in this vicinity. I have found them most numerous along thick osage orange hedges. About March 1, they begin to sing in chorus. I have counted several hundred in large flocks in which a large part of the birds were singing at the same time.

90. **Spizella monticola.** TREE SPARROW.— Abundant. First noted in 1909, Oct. 24, in the plum thickets by the Arkansas River near Mount Hope. In the following spring it was last noted March 12. The Tree Sparrow is a frequent dooryard visitor, coming to pick up crumbs. As far as I have observed it is an open bush bird and is never found in thick woods. It is a great weed seed eater.

91. **Junco hyemalis.** SLATE-COLORED JUNCO.— Abundant. In 1909 I first noted this species on Oct. 13, and in the following spring I last noted it April 12. On almost any day between those dates Juncos could be seen in the cemetery and on Fairmount Hill. I have found them most numerous around the cedar trees in the cemetery, and like the Tree Sparrow the Junco is a frequent dooryard visitor. They are more abundant during stormy weather, when they come in flocks of thousands. Juncos begin singing in the middle of March.

92. **Melospiza melodia.** SONG SPARROW.— Common in the fall, rare in midwinter, and abundant in the spring migration. In 1909 I first noted this species Oct. 2. It became abundant in October and re-

mained so until the last of December. On March 5, 1910, Song Sparrows suddenly became abundant and continued so until the middle of April. The last of the species was noted May 8. The favorite haunts of this bird are the shrubbery, tall grass and weeds by the ponds and Chisolm Creek. It is curious to note, however, that Song Sparrows were common in the tall weeds by the cemetery pond in the fall of 1909 when the pond was entirely dry. I have heard the song of this bird during its entire stay in this region, but it was more common in the spring.

93. **Ampelis cedrorum.** CEDAR WAXWING.— I have noted a flock in the cemetery every winter for five years. They are very erratic in their migrations. In the fall of 1909 I first noted the species Nov. 23; in 1910 I first noted them Nov. 2; in the fall of 1908 they did not appear at all but came in January, 1909. In 1910, they disappeared Feb. 15 until March 20, when they became numerous for two days and then left.

94. **Lanius borealis.** NORTHERN SHRIKE.— I have noted this species at least once every year for five winters. The earliest date was Oct. 24, in 1909. I have always found it in the open, on telephone wires or fences.

95. **Dendroica coronata.** MYRTLE WARBLER.— Abundant in the cemetery during warm winter weather. During the winter of 1909–10 these warblers disappeared entirely during stormy periods. I noted them irregularly from Nov. 6, 1909, to April 17, 1910.

96. **Anthus rubescens.** AMERICAN PIPIT.— Abundant during February and March, 1910, in prairies and pastures. I first noted this species Jan. 29, 1910. After that I often flushed flocks of hundreds from prairies. Apparently they had migrated by the middle of April, but I flushed a large flock in a wheat field, north of Chisolm Creek, May 8. They were especially numerous in fields overgrown with crab-grass.

97. **Nannus hiemalis.** WINTER WREN.— Noted by Mr. Sullivan between Oct. 26 and Feb. 27.

98. **Certhia familiaris americana.** BROWN CREEPER.— One noted Jan. 18, 1911, in Riverside Park. Noted also by Mr. Sullivan.

99. **Sitta carolinensis.** WHITE-BREASTED NUTHATCH.— Noted a single bird in a maple tree near the business part of the city, calling loudly, Feb. 25, 1911. Noted by Mr. Sullivan, Jan. 11, 1909. Noted by Professor Larrabee, March 11, 1911.

100. **Myadestes townsendi.** TOWNSEND'S SOLITAIRE.— I have noted a pair near the evergreens in the cemetery every winter for five years. It sometimes feeds on the ground but will fly to a tree almost as soon as it is observed. I have seen Solitaires eating cedar berries. On Jan. 24, 1910, I noted a Solitaire in Riverside Park.

Migrants.

101. **Podilymbus podiceps.** PIED-BILLED GREBE.— Noted by Dr. Mathews as common.

102. **Larus argentatus.** HERRING GULL.— Noted by Dr. Mathews.

In Brown County, Kansas, I noted a solitary Herring Gull on May 4, following a corn lister, picking up grubs like the Blackbirds.

103. **Larus delawarensis.** RING-BILLED GULL.— Noted in the latter part of 1908 feeding with Blackbirds on plowed land east of Fairmount Hill.

104. **Larus franklini.** FRANKLIN'S GULL.— One noted April 30 and May 4, 1910, flying north.

105. **Sterna hirundo.** COMMON TERN.— Noted by Dr. Mathews as a frequent migrant.

106. **Hydrochelidon nigra surinamensis.** BLACK TERN.— On Sept. 9, 1909, I identified one shot by Mr. C. C. Whitaker, which he said was one of a flock. In 1910 I noted a flock of 7, and on May 22 two birds. On both occasions they were flying north. Professor Larrabee noted a Black Tern Oct. 9, 1909.

107. **Pelecanus erythrorhynchos.** WHITE PELICAN.— Noted by Dr. Mathews and Mr. Sullivan.

108. **Merganser americanus.** AMERICAN MERGANSER.— Noted by Dr. Mathews.

109. **Merganser serrator.** RED-BREASTED MERGANSER.— Noted by Dr. Mathews.

110. **Lophodytes cucullatus.** HOODED MERGANSER.— Noted by Dr. Mathews.

111. **Anas platyrhynchos.** MALLARD.— Noted six Mallards, shot at a Mt. Hope gun club, Oct. 25, 1909. During the spring of 1911, I noted Mallards shot by hunters, on several occasions. The earliest was Feb. 4. Mr. Smyth has noted that they are among the first of the ducks to arrive in the spring migration, often arriving by Feb. 1. In the fall they arrive about Oct. 1. He said regarding their feeding habits: "Mallards often leave water and go into the fields and feed all night. I have seen them sitting on kafir-corn shocks like Prairie Chickens. On one occasion two others and myself shot 55 Mallards while standing in a kafir corn shock."

112. **Chaulelasmus streperus.** GADWALL.— Noted by Dr. Mathews and Mr. Smyth.

113. **Mareca americana.** BALDPATE.— Noted several shot at the gun club near Mt. Hope, Oct. 24 and 25, 1909. Mr. Smyth has noted that this species begins to be common on the ponds about Oct. 10 in the fall, and March 10 in the spring.

114. **Nettion carolinense.** GREEN-WINGED TEAL.— I noted a flock of several hundred Green-winged and Blue-winged Teal on the Arkansas River near Mt. Hope, Oct. 25, 1909. This species, according to Mr. Smyth, arrives soon after the middle of September and stays in the country until the ponds freeze over. In the northward migration it returns during the early part of February.

115. **Querquedula discors.** BLUE-WINGED TEAL.— Noted with the preceding species on the Arkansas River, near Mt. Hope, Oct. 25, 1909. On May 11, 1910, I noted a pair on the cemetery pond. This duck is the

first to arrive in the fall and the last to go north in the spring. Mr. Smyth has shot Blue-winged Teal as early as Aug. 25.

116. **Querquedula cyanoptera.** CINNAMON TEAL.— Noted by Dr. Mathews as very rare.

117. **Spatula clypeata.** SHOVELLER.—Noted by Dr. Mathews and Mr. Smyth.

118. **Dafila acuta.** PINTAIL.— Noted a flock of 8 on McGuinnis's Pond Feb. 20, 1910. Mr. Smyth has noted that Pintails begin to arrive going southward about Oct. 20 and returning northward about Feb. 5. In 1891 he shot several of this species as nearly as Jan. 27.

119. **Aix sponsa.** WOOD DUCK.— I noted a pair on the cemetery pond April 25 and 26, 1910. Noted occasionally by Mr. Smyth, Dr. Mathews, and Mr. Sullivan.

120. **Marila valisineria.** CANVAS-BACK.— Noted by Mr. Smyth as being common in the fall after Oct. 20 and in the spring after March 1.

121. **Marila americana.** RED-HEAD.— Noted by Mr. Smyth as migrating with the Canvas-back. Common.

122. **Marila collaris.** RING-NECK.— Noted by Dr. Mathews.

123. **Marila marila.** SCAUP DUCK.— Noted by Mr. Smyth as common in the fall about Oct. 20 and in the spring about March 20.

124. **Marila affinis.** LESSER SCAUP DUCK.— Noted by Dr. Mathews.

125. **Charitonetta albeola.** BUFFLE-HEAD.— Noted by Mr. Sullivan.

126. **Erismatura jamaicensis.** RUDDY DUCK.— Noted by Mr. Smyth as common on the streams about Oct 15. They return in smaller numbers in the spring.

127. **Chen hyperboreus.** LESSER SNOW GOOSE.— March 15, 1911, I noted a flock of about 150, flying northward over Fairmount, about 50 feet high. Mr. Smyth has noted this species as a winter visitor during the warm days.

128. **Chen cærulescens.** BLUE GOOSE.— Noted by Dr. Mathews.

129. **Anser albifrons gambeli.** WHITE-FRONTED GOOSE.— Noted by Dr. Mathews as frequent but decreasing.

130. **Branta canadensis.** CANADA GOOSE.— Noted flocks Oct. 13, 1909, and Feb. 5 and Feb. 27, 1910. In other years I have noted this species during every winter month. I believe that this goose flies into this region occasionally on warm winter days.

131. **Branta canadensis hutchinsi.** HUTCHINS'S GOOSE.— Noted by Dr. Mathews.

132. **Branta bernicla glaucogastra.** BRANT.— Noted by Mr. Smyth as migrating southward about Oct. 15 and northward about March 15.

133. **Olor columbianus.** WHISTLING SWAN.— Noted by Mr. Smyth and Dr. Mathews.

134. **Ardea herodias.** GREAT BLUE HERON.— I noted a pair wading in Chisolm Creek, north of Fairmount college, May 8, 1910.

135. **Grus americana.** WHOOPING CRANE.— Noted as frequent by Dr. Mathews.

136. **Grus canadensis.** LITTLE BROWN CRANE.— Noted as frequent by Dr. Mathews.

137. **Grus mexicana.** SANDHILL CRANE.— Noted as frequent by Dr. Mathews.

138. **Rallus virginianus.** VIRGINIA RAIL.— Noted by Dr. Mathews.

139. **Gallinago delicata.** WILSON'S SNIPE.— Noted as abundant by Dr. Mathews. Mr. Smyth has bagged snipe as early as Sept. 14, and has noted them migrating northward commonly on April 15.

140. **Pisobia maculata.** PECTORAL SANDPIPER.— I noted several at the cemetery pond during April, 1909. Noted as abundant by Dr. Mathews.

141. **Pisobia minutilla.** LEAST SANDPIPER.— Very common, wading in the borders of the cemetery pond during April, 1909. I often saw as many as 6 in a group.

142. **Totanus melanoleucus.** GREATER YELLOW-LEGS.— Noted by Dr. Mathews.

143. **Totanus flavipes.** YELLOW-LEGS.— Noted by Dr. Mathews.

144. **Helodromas solitarius.** SOLITARY SANDPIPER.— Common. Noted in the fall of 1909 between September 9 and September 26, and in the spring of 1910 between April 17 and May 17, and in the fall of 1910 between Aug. 28 and Sept. 15. The largest number that I have observed in one day is 14, which I saw at intervals wading in Chisolm Creek on May 8, 1910.

145. **Catophophorus semipalmatus inornatus.** WESTERN WILLET. — Noted by Dr. Mathews.

146. **Numenius longirostris.** LONG-BILLED CURLEW.— Noted by Dr. Mathews.

147. **Numenius hudsonicus.** HUDSONIAN CURLEW.— Noted as common by Dr. Mathews.

148. **Accipiter cooperi.** COOPER'S HAWK.— Noted Oct. 1, 1908, and Sept. 19, 1909, by Mr. Sullivan. In one case the bird was flying around in the business part of the city.

149. **Buteo lineatus.** RED-SHOULDERED HAWK.— Mr. Sullivan noted a flock of this species, Oct. 1, 1908, numbering 180, and several small flocks in the fall of 1909.

150. **Falco mexicanus.** PRAIRIE FALCON.— I noted one perched on a lower branch of an elm tree in the cemetery, April 25, 1909.

151. **Asio wilsonianus.** LONG-EARED OWL.— Noted one in the cemetery, April 19 and April 24, 1910, taking refuge in cedar trees.

152. **Asio flammeus.** SHORT-EARED OWL.— Noted one in a ravine east of the cemetery, March 16, 1910.

153. **Strix varia.** BARRED OWL.— A flock of six of these owls stayed nearly a week in the cemetery during March, 1909. In the daytime they hid in cedar trees.

154. **Empidonax minimus.** LEAST FLYCATCHER.— One noted in a clump of willows in Riverside Park, May 1, 1910, and another in a locust hedge in the cemetery, May 17, 1910.

155. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.— On Sept. 23, 1909, I noted a flock of 7, and another flock of about 20, April 28, 1910.

156. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.— Throughout the whole of September and the first two weeks of October, 1909, this species was abundant. The last date upon which I observed it was Oct. 18. In the spring of 1910 one flock was reported by Mr. Larrabee April 28. In September, 1910, I noted but one small flock. During the fall of 1909 these birds were always in large flocks and were either in kafircorn fields or in cottonwood trees.

157. **Pooecetes gramineus.** VESPER SPARROW.— Two birds were noted by Professor Larrabee in the prairie grass by the slough east of Fairmount.

158. **Ammodramus savannarum australis.** GRASSHOPPER SPARROW.— Noted by Dr. Mathews as common.

159. **Zonotrichia leucophrys.** WHITE-CROWNED SPARROW.— On Oct. 18, 1909, I counted 14 of these birds in the scattered shrubbery along Chisolm Creek north of Fairmount. On May 9, 1910, I saw one in an orchard on Fairmount Hill.

160. **Spizella pallida.** CLAY-COLORED SPARROW.— A common spring migrant, noted nearly every day between April 30 and May 17, 1910, on Fairmount Hill and in the cemetery. It was nearly always in small flocks.

161. **Peucæa cassini.** CASSIN'S SPARROW.— Noted by Professor Larrabee several times in the spring of 1910. The earliest date was April 26.

162. **Passerella iliaca.** FOX SPARROW.— Noted by Mr. Sullivan during the months of November, January, February, and May.

163. **Vireo belli.** BELL'S VIREO.— Noted by Dr. Mathews as frequent.

164. **Vermivora peregrina.** TENNESSEE WARBLER.— Noted by Professor Larrabee, Oct. 10 and 11, one bird being seen in the cemetery and the other in a hedge east of Fairmount.

165. **Setophaga ruticilla.** REDSTART.— Noted by Dr. Mathews.

166. **Bæolophus bicolor.** TUFTED TITMOUSE.— Common in the woods along the Arkansas River south of Wichita, April 18, 1910. The birds were very noisy and sang a great deal. It was also seen by Mr. Sullivan and Professor Larrabee March 19, 1911.

167. **Polioptila cærulea.** BLUE-GRAY GNATCATCHER.— Eight birds noted April 18, 1910, in the tall timber by the Arkansas River south of Wichita. Most of the time they stayed high in the trees and were very noisy.

168. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.—

Common spring migrant. Noted between May 4 and 17, 1910, nearly every day, on Fairmount Hill and in the Cemetery. On May 17 I counted 82 of this species feeding on the ground in the cemetery. This was by far the largest number that I have ever seen in any one day.

Occasional Visitors.

169. **Æchmophorus occidentalis.** WESTERN GREBE.— Dr. Mathews noted one killed on the Little Arkansas River in 1887.

170. **Colymbus nigricollis californicus.** EARED GREBE.— Dr. Mathews has noted this species two different years.

171. **Gavia immer.** LOON.— Two birds noted by Dr. Mathews.

172. **Phalacrocorax auritus.** DOUBLE-CRESTED CORMORANT.— One known to Dr. Mathews.

173. **Pelecanus occidentalis.** BROWN PELICAN.— One bird noted by Mr. Sullivan April 25, 1910, flying north.

174. **Anas rubripes.** BLACK DUCK.— Two specimens, identified by Dr. Mathews.

175. **Clangula clangula americana.** GOLDEN-EYE.— Three noted by Dr. Mathews.

176. **Harelda hyemalis.** OLD SQUAW.— Dr. Mathews has identified three of this species.

177. **Oidemia perspicillata.** SURF SCOTER.— One specimen, identified by Mr. Sullivan and Dr. Mathews. The bird was shot Oct. 23, 1910.

178. **Plegadis guarauna.** WHITE-FACED GLOSSY IBIS.— Noted three times by Dr. Mathews.

179. **Ajaia ajaja.** ROSEATE SPOONBILL.— One killed by Dr. Mathews in 1900.

180. **Herodias egretta.** GREAT WHITE EGRET.— One specimen, identified by Dr. Mathews in 1891.

181. **Egretta candidissima.** SNOWY EGRET.— Noted by Dr. Mathews during the summer of 1891.

182. **Florida cærulea.** LITTLE BLUE HERON.— Noted by Mr. Sullivan during the summer of 1907 along the Little Arkansas River.

183. **Nycticorax nycticorax nævius.** BLACK-CROWNED NIGHT HERON.— Dr. Mathews saw a flock of young during the summer of 1891. He has noted but one mature bird in this county.

184. **Gallinula galeata.** FLORIDA GALLINULE.— One bird noted by Dr. Mathews in 1898 and another in 1899.

185. **Steganopus tricolor.** WILSON'S PHALAROPE.— A pair were brought to Dr. Mathews that are now in his collection.

186. **Recurvirostra americana.** AVOCET.— Three specimens are known to Dr. Mathews to have been taken in the county.

187. **Philohela minor.** WOODCOCK.— One noted by Dr. Mathews in 1887, and one by Professor Larrabee Oct. 3, 1910.

188. **Macrorhamphus scolopaceus.** LONG-BILLED DOWITCHER.— One was brought to Dr. Mathews.

189. **Squatarola squatarola.** BLACK-BELLIED PLOVER.— One was identified by Dr. Mathews.

190. **Charadrius dominicus.** AMERICAN GOLDEN PLOVER.— Noted by Dr. Mathews.

191. **Ictinia mississippiensis.** MISSISSIPPI KITE.— One noted by Dr. Mathews.

192. **Accipiter velox.** SHARP-SHINNED HAWK.— Noted by Dr. Mathews.

193. **Aquila chrysaëtos.** GOLDEN EAGLE.— Noted by Dr. Mathews and Mr. Sullivan.

194. **Haliæetus leucocephalus.** BALD EAGLE.— Noted by Dr. Mathews.

195. **Falco columbarius.** PIGEON HAWK.— One killed by Dr. Mathews in December, 1901.

196. **Pandion haliaëtus carolinensis.** OSPREY.— One shot by Dr. Mathews in 1892.

197. **Nyctea nyctea.** SNOWY OWL.— One shot by Dr. Mathews in 1891.

198. **Antrostomus carolinensis.** CHUCK-WILLS-WIDOW.— A bird captured by Dr. Mathews was submitted to Dr. F. H. Snow of the University of Kansas for identification, and is mentioned by Dr. Snow in his 'Catalogue of the Birds of Kansas.'

199. **Dolichonyx oryzivorus.** BOBOLINK.— One flock noted by Dr. Mathews.

200. **Euphagus carolinus.** RUSTY BLACKBIRD.— Noted by Dr. Mathews in the winter of 1901–02.

201. **Hesperiphona vespertina montana.** WESTERN EVENING GROSBEAK.— One noted by Dr. Mathews.

202. **Loxia leucoptera.** WHITE-WINGED CROSSBILL.— A small flock was twice noted by Mr. Sullivan in the fall of 1910.

203. **Plectrophenax nivalis.** SNOW BUNTING.— Noted by Mr. Sullivan Feb. 24, 1910.

204. **Junco hyemalis connectens.** SHUFELDT'S JUNCO.— One was noted by Professor Larrabee, March 6, 1911.

205. **Guiraca cærulea.** BLUE GROSBEAK.— Mr. Sullivan noted a pair June 3, 1910.

206. **Passerina ciris.** PAINTED BUNTING.— Noted one male May 17, 1907, in a blackberry briar patch in the north part of the city. One was noted by Dr. Mathews in 1887.

207. **Ampelis garrulus.** BOHEMIAN WAXWING.— A single bird in Dr. Mathew's collection was found by Garner Taylor in the cemetery one early spring morning after a hail storm, in 1904.

208. **Seiurus aurocapillus.** OVEN-BIRD.— One bird was noted by Dr. Mathews in Riverside park, June 8, 1902.

Summary.

Residents	23
Summer Residents	57
Winter Sojourners	20
Migrants	68
Occasional Visitors	40
Total	208

NOTES ON RECOGNITION MARKS IN CERTAIN SPECIES OF BIRDS.

BY JOHN TREADWELL NICHOLS.

IN 'Bird-Lore' for December, 1901, Ernest Thompson Seton published an article on recognition marks in animals. The subject has interested me ever since, and I have tried to explain by that hypothesis some of their colors as seen in the field.

It is frequently urged that the build, motions, and general appearance of a bird are what we, and doubtless also its associates, use in recognizing it. This certainly is often true; but on careful analysis, it is found that in many species it is some definite, conspicuous bit of color which catches the eye and gives them away. It is the dark back, sharp breast line and white outer tail feathers that demonstrate the Junco in the sparrow-filled shrubbery. A year ago this summer I had my first meeting with the Bohemian Waxwing in the Canadian Rockies. Of course we all know the chestnut under tail-coverts of this species are a conspicuous mark with the bird in the hand, but I was surprised to find how conspicuous they were in the field. As the birds took flight they were very noticeable, and this mark which so definitely separated the species from the allied Cedar Waxwing common in the same region, is doubtless of use to the birds themselves as well as to the human observer.

But aside from these one or two land birds, I wish to speak particularly of two groups of water birds,— the Albatross-Petrel group and the Shore Birds. Some years ago I spent some time studying the first at sea in the southern hemisphere where many species abound. The habit of life of all is similar. They fly constantly about close to the ocean surface looking for food. Often they must go some time without food, and doubtless when they do find it, it is as frequently in superabundance,— perhaps a school of fish, or squid, or a dead whale. Then they gather from all about to the feast. They have few enemies. Obviously a strong advertising coloration would be of advantage to such birds, coupled with recognition marks, as the food of the different species would be somewhat different. I found that the definite color patterns of the different species were most useful in separating them. The black and white Cape Pigeon has a color pattern at once conspicuous and diagnostic, differentiating it at any distance from the numerous petrels of similar size and flight found in the same regions. The gray-backed Slender-billed Fulmar has a light patch on the wing which is conspicuous and diagnostic when the bird is in flight In southern seas there are many petrels of about the size of a Cape Pigeon, dark above and white below, with dark under surfaces to the wings, whose plumage differs only in minor details. The feeding habits of the different species are doubtless alike, as they all follow a ship but rarely take a baited hook, which the Cape Pigeon and Slender-billed Fulmar do greedily, and which accounts for the disproportionate abundance of these two species in collections. Apparently the general type of color mentioned is a recognition mark shared by a number of species of similar habits. That this is true is made more probable by the fact that a markedly different type of plumage characterizes one or more species of petrels of about the same size and appearance otherwise but of quite different feeding habits which were observed at a distance or near to, going about their business, often in flocks and not coming about or paying attention to the ship. They had a great deal of white on the under surfaces of the wings, and the white of the breast running up towards the nape, marking off the dark top of the head from the remainder of the dark upper parts. Very probably part of them at least were the Greater Shearwater,

a species which should have been in southern waters at the season when they were observed there. When one was seen at a distance it was recognized at once by its striking color scheme, and I knew that though its course might lie across that of the ship it would not come about or follow her.

Then there are small albatrosses resembling one another in size and doubtless in feeding habits, belonging to *Diomedea* and *Thalassogeron*, collectively called "Molly-hawk" by sailors. They have the same type of coloration, white with a blackish mantle solid across the back, whereas the large Albatross *Diomedea exulans*, which has somewhat different habits on account of its much greater size, has the center of the back white. Although the large Albatross is of quite different build from the smaller ones, at long and uncertain range this difference of pattern was found to be the readiest and surest way of identifying it.

The sailing flight characteristic of petrels and albatrosses, in which the bird glides inclined first to one side, then to the other, displays particularly well the patterns of both upper and lower surfaces. The white rump of the Mother Carey's Chickens is not noticeable among the white-caps when the birds flit aimlessly hither and thither, but when they fly steadily in one direction, their unchanging position makes them conspicuous from the rear. At times one sees streams of Mother Carey's Chickens flying swiftly and steadily in one direction, quite unlike their usual custom. I fancy that if any delectable food becomes available, birds at a distance see others go to it and fly towards them, and we presently have streams of birds flying towards it from all the surrounding sea. When *Fregetta grallaria* gather to feed, the white rumps and lower surfaces of the high-held wings make a twinkling white effect conspicuous at considerable distance.

To turn to an entirely different group of birds, the writer has in the past few months had much experience with the Limicolæ. These are mostly flocking species, usually strong flyers, and preyed upon to an unusual degree by hawks, which attack them from above. In the main the species are concealingly colored. The Woodcock and Wilson's Snipe are particularly so. The Ring-neck and Piping Plovers match admirably the flats and dry sand they respectively frequent. The Semipalmated and Least Sandpipers

are very inconspicuous from above, even when moving actively about on mud flats. The color of a Yellow-leg I recently observed sitting quietly at the edge of a bit of marsh rendered it very inconspicuous, and I have seen a White-rump when startled, crouch down concealing the bulk of the dead white underparts and practically disappear against the brightly lighted mudflat on which it had been feeding. The Sanderling, which frequents the bright lights of the ocean line, is lighter colored than usual.

Yet most of the species when on the wing are conspicuous, and then, or particularly when starting to fly, show colors as clearly of recognition value as the diagnostic whistles of many species.

The writer finds the sharply contrasted black and white colors of the Sanderling's wing the best field mark to determine that species in any plumage. The White-rumped Sandpiper, a noncommital enough looking bird on the ground, is easily recognized by its white rump as it takes wing. Its tail is darker than usual in the group and emphasizes the white rump. The narrow white line in the wing of the Spotted Sandpiper has a different look from that of any other species, and the blackish under wing surfaces of the Solitary Sandpiper are at once an infallible and conspicuous criterion of that species. The black patch under the wing of the Black-breasted Plover, which distinguishes young and fall birds from the Golden Plover, is much more conspicuous than one would think. Only recently the writer was observing one on a distant tussock which he could not be sure was even a plover. As it took flight this mark could be seen and its *pe-a-we* note also proclaimed it.

There seems to be no good long-distance mark for telling Semipalmated from Least Sandpipers; with us they perhaps occur in mixed flocks, and need none. The white under-surfaces of a compact, swiftly moving flock of these birds showing conspicuously at intervals perhaps has some recognition and directive significance.

Few birds are as consistently concealingly colored as the Woodcock. Perhaps the whistling of its wings as it rises takes the place of recognition marks of other species.

At any rate advertisement is so common in animals that it is hard to believe it has no particular value to them. In the Canadian Rockies three species of mammals sometimes occur living in

close proximity, marmots, coneys, and a spermophile, striped something like a high-colored chipmunk. The marmots and coneys, harmonizing in color with the gray rock slides, are continually advertising their presence by persistent whistling and bleating. The conspicuously colored spermophile is silent.

In conclusion, the writer's observations foster the belief that advertising and concealing colors, each in its own way, are of value to a bird, and that the bird's plumage is determined as a compromise between the two adapted to its particular needs and habits. Probably there are other forces also acting more or less to determine the colors, as adaptation to light. Birds living in insufficient light have, as a rule, dark colors which absorb, those in superabundant light, lighter colors which repel it.

OBSERVATIONS ON THE YELLOW-BILLED TROPIC-BIRD (*PHAËTHON AMERICANUS* GRANT) AT THE BERMUDA ISLANDS.

BY ALFRED O. GROSS.[1]

Plates III–XI.

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THIS paper is based upon studies made while at the Bermuda Biological Station from June 17 to August 2, 1910, and from June 26 to August 5, 1911. It is a pleasure here to acknowledge my gratitude to Prof. E. L. Mark, director of the Bermuda Station, for many valuable suggestions and for revising the manuscript.

The geographical location of the Bermudas is unique, in that they are in mid-ocean about seven hundred miles from the nearest land. The longitude of the center of the group is 64° 39′ 53″ W.,

[1] Contributions from the Bermuda Biological Station for Research, No. 23.

about that of Halifax, and the latitude 32° 15′ 23″ N., or about that of Charleston, S. C., and of Los Angeles, Cal. The islands are nearly equi-distant from Halifax, New York, Charleston and the nearest of the West India Islands. The extreme isolation of the Bermudas is a fact of the utmost importance in considering its animal life, and especially its bird life, for the islands lie outside the courses of the great migration routes of the main land. As a consequence relatively few birds regularly visit the islands during the spring and fall migrations.

The Bermudas embrace over 150 islands, but the majority of these are extremely small and not inhabited by man. They form a long, narrow, hook-shaped group, which if placed in a straight line would reach not more than 15 to 20 miles. The width of this hook varies from one half mile to two miles. The total area of dry land is between 19 and 20 square miles, but the coral reefs extend over a much greater area. From the top of Gibb's Hill lighthouse, one of the two lighthouses of the islands, the ocean can be seen on all sides.

The vegetation is semi-tropical, but there is a predominance of second-growth cedars, which give the islands an appearance not unlike that which one may see on our own New England coast (Plate III, fig. 1). The majority of the larger islands are covered with these cedars, among which are interspersed clusters of palmetto palms. In the parks and private estates there are cultivated many trees, such as the royal, sago, cocoanut and grugu palms, the royal poinceana, the rubber tree, the pawpaw, etc. These give a decidedly tropical effect to certain sections of the islands. Since only a small part of the land is under cultivation, there are many neglected areas where the vegetation takes its own course, thus forming ideal resorts and nesting sites for many of the land birds. Along the low-lying shores of some of the inlets and bays are narrow but impenetrable thickets of mangroves, which are also a rendezvous for many birds, especially during the hot hours of the day. Mention should also be made of the luxuriant oleanders, which are in the prime of their beauty and fragrance during June and July. There are few features of the vegetation which contribute more to make these beautiful islands charming and attractive.

The greater part of the dry land of the islands consists of a limestone made up of the wind-blown fragments of shells and corals firmly cemented together. This rock is easily eroded, but when a fresh surface is exposed to the action of the weather for some time, it becomes hard and resistant. The shores of many of the islands are precipitous or overhanging cliffs, which have been honey-combed by the incessant action of the surf or the solvent effect of rains. It is among the recesses and caves of these cliffs that the Tropic-birds of Bermuda nest and rear their young.

The Yellow-billed Tropic-bird, *Phaëthon americanus*, locally known as the Boatswain Bird, or the Long-tail, is the only one of the two species of Tropic-birds of the West Indies which visit the Bermudas. These birds are tern-like in appearance and manner of flight, although belonging to the order Steganopodes. The gular pouch, which is characteristic of the Steganopodes, is entirely feathered and much reduced in size in the Tropic-bird, but it nevertheless functions as a pouch in the process of feeding.

The plumage of the adult Tropic-bird is a satiny white with the following prominent black areas: a spot in front of, and slightly below, the eye, which is continued backward as a narrow band through the ocular region; a large oblique band on the lesser wing coverts and extending thence on to the scapulars and inner secondaries; patches on the outer shafts of 5 or 6 of the primaries; and stripes on the flanks. The black markings on the primaries and secondaries are very conspicuous when the bird is seen in flight. The iris is dark brown, the tarsus bluish, and the toes and webs jet black. The bill varies from pale yellow to bright orange-red, depending on the age of the bird. The tail is extended into two very long central feathers, which are of variable length and color. In adult birds these feathers have a marked tinge of russet brown or dull salmon, but no individuals were seen in which there was a distinctly reddish color, such as is frequently described. In a very few there was a roseate tinge to the plumage, which was accentuated on the feathers of the neck and breast. There is no consistent variation in color or measurements which can be correlated with sex. The measurements of eight specimens are as follows:

	Sex	Length cm.	Tail cm.	Extent cm.	Wing cm.	Bill cm.	Foot cm.	Weight grams.
1.	♂	74.0	48.3	90.1	27.2	5.3	6.6	398
2	♀	64.3	36.8	91.5	27.1	5.1	6.4	425
3.	♂	49.2	22.1	90.7	28.1	5.2	6.2	465
4.	♀	43.1	15.1	89.1	27.1	4.9	6.5	402
5.	♂	48.7	20.4	91.6	27.5	5.0	6.4	367
6.	♂	54.0	21.8	88.5	27.8	5.0	6.9	385
7.	♀	44.2	15.0	96.2	28.1	5.4	6.7	——
8.	?	62.5	32.4	91.5	27.4	5.5	6.8	——

The variation of the tail measurement is very great in the above series, since nearly all of the specimens are of nesting birds, in which the longer of the two long tail feathers are frequently frayed or broken or even absent.

The geographical range of the Yellow-billed Tropic-bird includes the islands of the West Indies; it extends as far west as Central America, and north to the Bermudas. The following records of its occurrence in the United States have also been reported: One on the coast of Nova Scotia, September 4, 1870;[1] one in the interior of Nova Scotia after a violent storm, in September, 1870;[2] an immature specimen captured in Orleans Co., N. Y., 1879;[3] and one shot on the Banana River, Florida, April 21, 1886.[4] A few others have been reported off the coast of Cape Hatteras[5] and the coast of Florida.[6] Their occurrence in the United States is rare, and none have been found to breed on our shores.

The Tropic-birds migrate from the West Indies and, except for occasional stragglers, none are to be found in the Bermudas during the winter months. This annual migration flight is remarkable when it is considered that the birds must necessarily fly over open water for a distance of more than 600 miles without any landmark to guide them. The first Tropic-birds appear at the Bermudas during the latter part of February, according to fishermen and local observers, but the great bulk of them do not arrive until the first weeks of March. Mr. Mowbray, Superintendent of the Bermuda Aquarium, while making a voyage to Turk's Island in

[1] Reid, Bulletin U. S. Nat. Museum, 1884, vol. 25, p. 264.
[2] Gilpin, Orn. and Oö., 1882, vol. 7, p. 123.
[3] Coues, Bulletin, Nutt. Ornith. Club, 1880, vol. 5, p. 193.
[4] Brewster, Auk, 1886, vol. 3, p. 481.
[5] Gault, Wilson Bulletin, 1902, vol. 9, p. 141.
[6] Lawrence, Pacific R. R. Reports, 1858.

1909, saw on February 9 and 10 several groups of 2 or 3 individuals each, which were flying in a direct course for the Bermudas. This agrees with the supposed course of migration of the Tropic-birds and illustrates the keen sense of direction and orientation which they must possess. These birds would probably be admirable subjects for experimenting on orientation.

When we arrived at the islands, June 17, 1910, and June 26, 1911, the birds were in the midst of their nesting activities. During the early morning hours many of them could be seen in the vicinity of their nesting sites gracefully circling and wheeling high above the surface of the water, with their long graceful tail feathers streaming out behind. As the birds flew back and forth over the sound, their pure white breasts and underparts reflected the bright emerald green of the water, in such a manner as to give their plumage a distinctly greenish appearance. The effect thus produced under certain conditions of light is very deceiving even to an experienced observer.

The food of the Tropic-bird consists chiefly of marine animals, which in the majority of cases are secured by diving. The birds go on long foraging flights, wandering, according to some observers, as far as 50 miles from land. On our return trip to New York in 1910 a lone individual was seen which was estimated to be 150 miles distant from Bermuda, and on June 25, 1911, I saw two of these birds which were 200 miles from land. These are probably extreme cases, but they serve to illustrate the unusually long excursions which the Tropic-birds may make in their search for prey.

The food contained in the gullets and stomachs of 5 adult specimens was made up, for the greater part, of squids and fishes, especially small minnows. In one of the stomachs there were a few fragments of a crab and a sea urchin, as well as particles of material which could not be identified. Two of the five kinds of fishes found belonged to species of flying fish (*Exocœtus furcatus* and *Exonautes exsiliens*) which are common in the waters of Bermuda. It would be interesting to know whether or not these flying fish are captured while they are sailing above the surface of the water. The food delivered to the young varies with the age of the nestling, therefore is best considered in connection with the account of the young birds.

The adult birds are most active during the early morning hours; it is only occasionally that they can be seen feeding during the middle of the day, the heat at that time being perhaps great enough to account for the diminution in their numbers. A few of my notes taken July 8–9, 1910, when two of us spent the night on Morgan's Island, may serve to show something of the usual activities and how they are related in time to the activities of other birds. Morgan's Island is one of the several islands at the entrance of Ely's Harbor. The limestone cliffs on the seaward side constitute one of the most extensive and accessible rookeries of the Tropic-bird to be found in Bermuda, hence an ideal place for studying the habits of both old and young birds. My notes are as follows:

"July 9, 3:30 A. M. The first bird note heard is the clear ringing whistle of the Cardinal, which is roosting among the palmettos.

"4:00 A. M. The Catbirds are beginning to tune up.

"4:20 A. M. The White-eyed Vireos are joining the Catbirds in the oleanders.

"4:30 A. M. Dawn approaching rapidly; the distant upper clouds are reflecting the light of the morning sun.

"4:50 A. M. In the cedars, European Goldfinches are beginning to sing, but their notes can scarcely be distinguished in the exuberant chorus of other songsters.

"5:00 A. M. Sunlight to be seen on the trees of the hilltops.

"5:05 A. M. First Tropic-bird leaves the cliff.

"5:10 A. M. At some distance from our hiding place two more Tropic-birds appear.

"5:20 A. M. Tropic-birds are leaving the nests situated close about us. Some of them apparently have discovered our presence and are showing signs of uneasiness.

"5:45 A. M. At some distance out at sea an adult bird makes a perpendicular dive into the water from a height of about 50 feet.

"6:00 A. M. Many Tropic-birds are flying about on the sea side of the island. Birds are constantly leaving or returning to their nests.

"6:25 A. M. Songs of the land birds diminishing in volume.

"6:30 A. M. About 50 Tropic-birds can be seen at one time in the immediate vicinity of the cliffs and many others are either going out or returning from the sea."

The numbers remained practically constant until about 8:30 A. M., when there was a uniform, but rapid decrease, and by 11:00 A. M. there was only an occasional Tropic-bird to be seen flying about. The birds were again active during the few hours before sunset, but the numbers at this time never equalled those of the morning hours.

The diving of the Tropic-bird is remarkable in that the plunge is usually made from a height of 50 feet or more above the surface of the water. The bird after sighting its prey poises a second or two in mid-air by rapidly vibrating the wings, meanwhile maintaining a gaze on its victim. It then turns quickly at right angles and with wings folded darts through the air with the swiftness and precision of an arrow. Frequently this downward plunge takes the form of a spiral descent. It is uncertain whether this spiral course is the result of a voluntary act or not.

Nests of the Tropic-bird were found in favorable places among the cliffs at Ely's Harbor, Hungry Bay, Tucker's Town, Harrington Sound, Castle Harbor, Spanish Point and on nine of the islands of Great Sound. Verrill [1] estimated that 2000 pairs were breeding in the islands in 1901. Apparently the numbers have not changed very much since that time. The majority of the nests found during the latter part of June contained either eggs or else young in well advanced stages of development. This fact, correlated with the time of arrival of the birds and the period of nesting, indicates that there are probably two nesting periods in a season. Buckenham [2] states that several broods are reared during the year. There are doubtless two, but certainly not more than two, broods in a season reared by these birds while in the Bermudas.

Particular localities, especially on the south shore of the main island, seemed to be preferred by many of the birds. At Ely's Harbor and Tucker's Town it was not unusual to find as many as 50–75 pairs nesting within a range of less than 100 yards. The Tropic-birds are not, however, strictly gregarious, for isolated nests about the islands of the sound were very common. The so-called colonies probably exist because of the many choice nesting

[1] The Bermuda Islands, 1901–03, p. 680.
[2] Museum, 1894, pp. 15–16.

sites which chance to be situated in the particular locality, rather than to any gregarious or social instinct on the part of the birds.

The nature of the nesting site varies from that of the open places on the shelf-like ledges to that of the inner end of a narrow and circuitous passage, or the recesses of an obscure cave. In the two latter situations the presence of the adult bird may often be ascertained by inserting a long pole into the opening, which usually brings forth a shrill cry in response to the intrusion. At Tucker's Town nests were found in shallow excavations in the side of a high sand dune which ran along the shore. These cavities, which apparently were made by the birds themselves, were in each case at the base of some herbage, which to a certain degree shielded and protected the bird from the intense heat and light of the sun.

The height of the nest above the water varies greatly; it ranges from a point just above the high water mark to one situated near the top of the highest cliffs, perhaps 75 or 100 feet above the sea. At Ely's Harbor some of the nests were so low that during an unusually high tide accompanying a storm, they were overwashed by the waves and filled with heaps of sargassum and other sea weeds. The sargassum is found in many of the lower open nests, where it is deposited by the giant waves during the severe tempests of the winter months. No nesting material is ever collected by the birds, but the single egg is deposited on the bare rocks or else on the mat of sea weeds already present.

The nests most favorable for study and photography are those which are exposed to view and are open to the light, but unfortunately these are the ones most liable to destruction by the elements or by natural enemies. As a consequence nests in shallow but well protected cavities, from which the eggs and the young could be easily removed from time to time, were more desirable, being less liable to molestation. Nine such nests located on four of the islands of the sound near to the laboratory on Agar's Island were chosen for daily observations on the growth and development of the young. On Agar's Island a large observation box was constructed within four feet of a nest, from which more minute observations of the feeding habits could be made.

The eggs are extremely variable in their coloration and markings. In general they have a chalky white or creamy groundwork thickly

spotted with three colors: chestnut, chocolate brown, and purplish red. The spotting is usually more dense at the larger end and quite often presents a blotched or smeared appearance (Plate VI, fig. 8). On other specimens the distribution of markings is more uniform, there being no predominance of color at the larger end (Plate VI, fig. 7).

The chocolate color is easily rubbed off, especially when the egg is first immersed in water. Even the contact of the bird's body during incubation may remove more or less of the color.

The measurements of 8 eggs collected form various parts of the islands are as follows,—

	Longest diameter cm.	Shortest diameter cm.	Weight grams
1.	4.9	3.6	37
2.	5.1	3.6	35.2
3.	5.2	3.8	39
4.	5.2	3.6	38
5.	5.4	3.9	44
6.	5.6	4.1	40.9
7.	5.7	3.8	44
8.	5.8	3.7	45

The incubated egg weighs slightly less than the fresh egg.

The birds copulate in the recesses of the cliffs and apparently in the niche eventually to be used as a nesting site. At Bethel's Island I found two pairs copulating in different places in the rocks. In one case the female was bleeding about the head from wounds made by the male in his desperate attempts at holding the bird during copulation. Both females presented a somewhat mussed and haggard appearance. During the four days elapsing before the next visit to the island, eggs were deposited in these nests, and in all probability by the females previously observed. Several other pairs of adult birds were found together, but in these cases there was no evidence of copulation and no clew for the identification of sex.

Both the male and female birds take part in incubation, and during this period the egg is seldom left uncovered for more than a few minutes. The birds take their turns at the nest, thus giving each other an opportunity to feed. In one case an adult was seen feeding its mate while the latter was brooding the egg.

The period of incubation was not accurately ascertained, since the exact dates of the laying of the eggs under observation was not determined. One egg, which seemed fresh when found, required 28 days of incubation for the young to emerge. Other eggs under daily observation required from 15–25 days, but evidently these had been incubated some days when first observed.

The shell membranes of the eggs are resistant and leathery, a condition well adapted to withstand the sharp points of the stones and the hard barren surfaces on which the single egg is usually deposited. The young require considerable time to rupture this membrane even after the egg is pipped and fragments of the calcareous shell are broken away (Plate VI, fig. 9). In one, perhaps unusual, case the egg was pipped and the "peep" of the contained embryo was heard 42 hours before it had completely emerged.

The adult birds became accustomed to my frequent visits to their nests and allowed me to stroke them or to remove the egg without any sign of resistance. At the hatching of the egg, however, there was a profound change in the behavior of the parent birds.

The presence of the little one seemed to incite in them a ferocious antagonism against any intruder, and it was only with the greatest care and precaution that the little one could be safely removed for study. After some time had elapsed the parent birds seemed to adjust themselves to the new conditions and were approached with less or no opposition.

Nesting birds, although not accustomed to regular visits by any one, would allow an observer to operate a camera within a few feet of them, if care were taken to make no quick or unexpected movements. If the intruder approached nearer, the bird bristled up its feathers, spread its wings, and responded with a quick thrust of its sharp beak. After repeated annoyance the parent bird will leave the nest, an act, however, which it seems very averse to doing. This reluctance may be due to its helplessness while on its feet. The birds never walk upright, but the body is shoved along in a cumbersome manner by their diminutive legs. The wings are often brought into service for supporting and balancing the comparatively heavy body, which is scarcely raised above the surface on which the bird is moving (Plate IV, fig. 3). On first leaving the nest the adult bird leaps from the ledge and nimbly catches

itself on the wing, but sometimes, especially after being irritated or excited, it may fall to the water before taking flight. When once poised in the air, the Tropic-birds may be classed with the most graceful of sea birds. They have a very characteristic movement when flying, which is very unlike any other bird I know. Although these birds allow one to approach while on their nests, they are very cautious in returning to the nest if there is any suspicion of the presence of a human being in the immediate vicinity.

Among the enemies of the Tropic-birds are the colored natives, who molest the nests of the birds in spite of the stringent bird laws of the islands. It is probable the eggs collected are used as food. The robbing of nests for such purposes is said to be common in the West Indies. The wood rat (*Mus alexandrinus*), however, is responsible for some of the mysterious disappearances of the many eggs I had under observation. On one of my daily rounds to the nests on Two-Rock Island I caught one of these rats in the act of sucking an egg. The greedy creature was allowed to finish his meal, after which he was killed and preserved as evidence against his kind. I saw no other rats in the act of molesting eggs, but no doubt they find the Tropic-bird eggs a convenient source of food.

All of the Tropic-birds examined were infested with at least a few and sometimes with thousands of mites, of which there were three species at least. These mites never appear to be fatal to the bird, but nevertheless they must cause a disagreeable irritation when numerous. They feed upon the barbules of the feathers and in some instances this injury to the feathers may be so extensive as to cause a noticeably rough appearance of the plumage. Three species — identified by H. E. Ewing of Cornell University — were found in great abundance on some of the skins. *Docophorus breviantennatus* Piaget, belonging to the Mallophaga, is a large black form, which is very conspicuous when seen on a background of pure white feathers. The two species of true mites are *Alloptes microphaethon* Frb., and *Alloptes longipes, n. sp.*, belonging to the family of Analgesidæ. The new species, *Alloptes longipes*, is described by Dr. Ewing in Psyche, Vol. 18, No. 1, p. 41.

III. LIFE HISTORY.

In the study of the life history of the Tropic-bird I was somewhat handicapped, since the life of the young spent in the nest extends over a peroid longer than the time at my disposal during either summer in Bermuda.

However, there was an abundance of material near the Biological Station, which enabled me to secure measurements, descriptions and photographs of every phase of their development. Daily observations and measurements were made of five birds of various ages, two of which are at either end of a complete series. By a careful comparison of the measurements (see Table, pp. 61–62) and descriptions of these two birds, it was possible to match them at the 33rd day of development. In making these comparisons the measurements of the tail, wing, bill, and foot were given greater weight, since these measurements seem to be more constant for different individuals of the same age. Furthermore, it is extremely difficult to measure accurately the extent and length of an active living bird, which never fails to offer great resistance to such a procedure. If the comparisons are correct, the length of time spent by the young Tropic-bird in the nest extends over a period of 62 days, or about two months. The time required for incubation, previously noted, is about 4 weeks, making the complete period about 3 months. The adult birds remain in the islands about 7 months, which affords them ample time to rear two broods, but not more, during any one summer in Bermuda. The following records of three of our land birds are interesting in comparison with those of the Tropic-bird.

	Time required for incubation.	Time spent by the young in the nest.	Total.
Finch [1]	9 days	10 days	19 days
Flicker [2]	12 days	25–28 days	37–40 days
Golden Eagle [1]	30 days	90 days	120 days

The measurement of extent in the freshly hatched bird is less than the length, but this relation is reversed at the end of the 6th day, and by the time the young bird is ready to leave the nest the extent becomes three times the length minus the tail or more than

[1] W. L. Finley, American Birds, pp. 245–246.
[2] A. R. Sherman, Wilson Bull., 1910, pp. 135–171.

twice the total length. Furthermore, the wings undergo their greatest development during the last few weeks spent in the nest, while the feet grow but little after the first month. This seems a most favorable condition in view of the fact that the feet are functional and necessary from the very beginning of the free life, while an extensive development of the wings in the early part of the life history would prove a great inconvenience.

TABLE OF MEASUREMENTS.

Age, days.	Length, cm.	Tail, cm.	Extent, cm.	Wing, cm.	Bill, cm.	Foot, cm.	Weight, grams
1	11.9		11.2	1.6	1.2	2.8	25
2	12.4		11.3	1.7	1.2	2.8	28
4	12.7		11.9	1.8	1.3	2.8	35
5	13.2		12.6	2.0	1.3	3.0	49
6	14.0		14.2	2.3	1.3	3.3	54
7	14.6		15.3	2.4	1.4	3.4	66
8	16.1		16.7	2.5	1.4	3.6	92
10	16.9		18.5	2.8	1.5	3.8	86
11	16.9		19.6	2.8	1.6	3.9	72
12	17.8		20.1	3.0	1.7	4.1	146
13	18.7		22.1	3.1	1.9	4.2	128
14	19.2		24.3	3.2	1.9	4.5	157
15	20.1		25.4	3.5	2.0	4.7	145
16	21.0		26.2	3.7	2.1	4.8	127
17	21.0		26.7	3.9	2.2	4.8	121
18	21.8		28.6	4.6	2.3	5.2	173
20	22.9		32.5	5.5	2.4	5.4	232
21	23.0		33.9	5.8	2.6	5.5	267
22	24.1	.4	36.1	6.2	2.7	5.6	253
24	24.3	1.0	37.6	6.9	2.9	5.6	250
25	25.9	1.5	40.7	7.2	3.0	5.7	303
27	26.9	1.9	43.0	8.0	3.1	5.8	302
28	27.4	2.4	45.1	8.7	3.2	5.9	321
29	27.6	2.6	46.6	9.4	3.3	6.0	349
30	27.9	3.1	48.6	10.1	3.4	6.1	325
31	28.7	3.2	49.8	10.4	3.5	6.1	359
32	29.1	3.5	51.6	10.8	3.6	6.1	353
33	29.9	3.7	52.9	11.2	3.6	6.1	348

TABLE OF MEASUREMENTS (*Continued*).

Age, days.	Length, cm.	Tail, cm.	Extent, cm.	Wing, cm.	Bill, cm.	Foot, cm.	Weight, grams.
34 ?	29.8	3.8	57.8	11.5	3.7	6.0	357
36 ?	31.1	4.1	59.1	12.6	3.8	6.1	355
37 ?	31.5	4.5	60.2	13.1	3.8	6.2	377
38 ?	32.3	4.9	62.8	14.2	3.9	6.2	390
39 ?	33.0	5.6	64.7	15.7	4.0	6.3	422
41 ?	34.5	7.1	70.4	17.5	4.2	6.3	570
48 ?	39.4	10.1	80.7	21.6	4.3	6.4	510
52 ?	40.6	11.2	82.4	22.2	4.4	6.5	497
57 ?	41.4	13.1	83.2	24.2	4.6	6.5	499
60 ?	42.6	13.7	86.1	24.6	4.6	6.6	467
62 ?	Left the Nest.						
Average growth per day.	.520	.380	1.269	.390	.058	.064	7.58
Percent of total growth accomplished, on the average, each day.	1.69	2.86	1.69	1.70	1.71	1.68	1.71

The above table of measurements is made from the studies of two birds which stand one at either end of the series. The two life histories seem to overlap but match comparatively well at the 33rd day of development. The age of the older bird is only approximately known (within 4 or 5 days), since the measurements of different young of the same age may vary as much as the growth of four or five days.

The weights of the young birds fluctuated a great deal from day to day; this was due to the fact that they were weighed in the morning after feeding time. A series of weighings made during the night, or very early morning before any food has been received by the young birds, would undoubtedly be less variable.

One of the young at the time of hatching when thoroughly dry and before it was fed weighed 25 grams, or 19 grams less than the egg from which it hatched. Another young bird weighed on the day of hatching 30 grams; but this individual was not watched and therefore it may have received food.

The food of the young during the first 10 or 15 days consists of snails and soft marine animals. In some cases it seemed to be

merely the regurgitated juices and semidigested food from the gullet of the parent bird. When the birds are between 15 and 30 days old, more than 90 % of the food consisted of squids, the remainder being made up of small minnows and some unidentifiable material. During the latter half of the young bird's life fish constitutes a large part of the food, although many squids, some of considerable size, were present in nearly every specimen examined.

It was not necessary, in most cases, to kill the bird in order to make an examination of the food, for the young birds, especially those of an age in which the instinct of fear was acquired, violently regurgitated their food on the slightest provocation, even the mere handling of the birds unaccustomed to my visits would cause them to throw up the entire contents of their gullets. By taking advantage of this simple means, it was easy to gain information about the food without causing the birds any serious injury. Below are lists of the animals, with their weights, which were found in five such regurgitations of different birds ranging from 30 to 50 days old, arranged in the order of the ages of the birds, No. 1 being the youngest.

No. 1.

Squid	17 grams.
"	11.1 "
Minnow	2.4 "
	30.5 grams.

No. 2.

Squid	16.9 grams.
"	16.7 "
"	3.1 "
	36.7 grams.

No. 3.

Squid	13.1 grams.
"	10.1 "
"	9.0 "
"	2.5 "
"	3.0 "
Minnow	2.1 "
	39.8 grams.

No. 4.

Squid	27.3 grams.
"	16.8 "
"	14.5 "
"	6.5 "
"	5.7 "
Flying Fish (part)	4.5 "
Fragments	3.2 "
	78.5 grams.

No. 5.

Squid	22.5 grams.
"	9.5 "
Flying Fish	10.0 "
" "	9.0 "
" "	7.5 "
4 minnows and fragments	26.5 "
	85.0 grams.

The amount of food regurgitated by No. 4 and No. 5 may seem excessive, since it equals about $\frac{1}{5}$ to $\frac{1}{6}$ of the total weight of the bird, yet such quantities of food in one gullet were not unusual. Since the birds ordinarily are fed only during the early morning hours, one should expect to find large quantities of food delivered at this single meal. The squids, which, as we have said, make up the largest part of the food of the young, as they also do that of the adult birds, are probably captured out at sea, for I saw very few squids when making collections of marine animals about the islands. Thousands of squids are eaten each day by these birds, so there must be an enormous quantity of them in the vicinity of their feeding grounds.

The young birds become very fat and heavy during the last 10 or 15 days of their life in the nest, and in all cases under observation they weighed more at this stage than the heaviest of the adult birds. This storing up of substance which may later serve as food prepares them to withstand the strenuous ordeal required of them upon leaving the nest.

At the time of hatching, the young Tropic-bird is to all appearances a ball of fluffy down with its dark colored beak and black feet standing out in marked contrast to the background of white (Plate VII, fig. 11). It is only the region about the beak, the underparts, and the middle of the back which are pure white, for the remainder of the plumage, especially the crown, sides of the back, and region of the wings has a decided tinge of dull gray.

The eyes of the nestling remain closed for one or two days, but the young birds are very active and responsive from the very beginning. A mere touch, or even the click of the camera, is enough to incite the creature to extend its neck and open its beak in eager anticipation of some lucious snail or other appetizing morsel of food. In taking pictures of some of these birds, it was necessary to click the shutter several times before attempting the final exposure, in order to avoid the gaping attitude.

At the end of the fourth day (Plate VII, fig. 12) the birds have their eyes fully opened, but they blink incessantly when brought out to the open light.

During the first ten days of life in the nest the chief changes which occur are concerned with size, for no feathers appear during

this stage of the nestling. The beak becomes lighter in color, but the skin in front of the eyes (lores) and at the base of the upper mandible (front) remains jet black. The tarsus is bluish, but the toes and webs are black, as in adult birds. The down on the breast is much shorter and denser than elsewhere, thus forming a firm mat, which protects the tender body from the sharp stones or rough surface of the rock on which the bird is usually obliged to rest. A characteristic pose of the bird at this age is one with its body and head outstretched on the bottom of the nest (Plate VIII, fig. 14). This position was frequently assumed whether the bird was awake or asleep. The young showed no evidence of fear during the first two weeks, for when I approached the nest, they did not seem to be afraid of me. Often when I placed my hand near them they would pick at my fingers as if testing some new and strange kind of food. The young birds which I visited daily never developed an instinct of fear; but, on the contrary, as they grew older they seemed to be pleased to have me make a call during the long hours when they were left alone.

The adult birds remain very closely with the young during the first ten days. The little fellow is usually tucked in under the feathers of the adult and frequently sleeps with its head projecting through the feathers, just as a little chicken does when it is brooded by the old hen. When the little creature became restless the old bird uttered a series of low guttural sounds, which, I assume, were intended as disapproval.

At the end of the 16th day were seen the first feathers. They made their appearance on the scapular region of the spinal tract (Plate VIII, fig. 14). By separating the down, the tips of the bluish colored sheaths of the feathers may be seen projecting through the dark skin. The feathers grow rapidly, soon lose their sheaths, and by the 20th day are well expanded, producing a conspicuous patch of black-and-white barred feathers (Plate IX, fig. 15). By this time the sheaths of the feathers of the breast, the primaries, secondaries, and tail feathers appear, but they do not show through the coat of down until several days later. During the first twenty days the bill assumes more and more the shape and proportions of that of the adult. Its dark bluish color changes to a white or flesh color, but the tip of the mandibles retains a

brownish tinge. The skin about the base of the upper mandible and the lores remains jet black and is devoid of down or feathers at this age.

From the 20th to the 35th day marked changes in the plumage occur. At the end of the 25th day the developing wing feathers are so heavily charged with blood that the nestling is unable to support its wings continuously (Plate IX, fig. 16).

By the end of the 35th day the wing feathers, including the coverts, are well expanded and now form with the scapulars, which were the first feathers to appear, a continuous band. The down gradually frays away as the feathers replace this first protective covering.

The tail feathers are well advanced during this period, and by the 35th day the two central tail feathers, destined to become the long feathers in the tail of the adult, attain a length of 4 cm. The feathers of the head and rump, although sprouted, do not show through the coat of down; so, when the bird is viewed from the side it displays alternate areas of down and feathers (Plate X, fig. 17). The feathers of the breast become well expanded at the 37th day and with the down form a veritable feather mattress, on which the bird rests or crawls about the nest (Plate X, fig. 18). The feathers about the base of the beak have appeared and now completely conceal the dark skin. The black loral spot, so conspicuous in the adult, is now well differentiated.

The adult bird spends less time with the young as the latter becomes older, at least this is true of the birds which were under continual observation. After the 20th or 25th day the young bird on Agar's island was visited by the parent bird only during the morning at feeding time. The adult bird usually appeared about 6 o'clock and after 2 or 3 visits was seen no more until the next day. After being fed the young bird settled down for a profound sleep, but at irregular intervals, from some unknown impulse, it would suddenly arise, stretch its wings, preen its feathers, and then settle down again for another nap. In the afternoon the young bird was usually awake and would amuse itself by picking at the stones about the nest, or perhaps would snatch at the flies or gnats which were often abundant in the vicinity of the nest. At other times it would spend much time oiling and preening its

feathers by running its beak through its plumage. When I chanced to make a noise in the observation box, the bird would suddenly squat down and with an excited look peer out towards the opening of the nest to see what was going on.

At night the young bird slept most of the time, but when daybreak came, it was all alert and very attentive to every noise which in any way suggested the coming of the parent with the customary breakfast. The adult bird when it appeared uttered a peculiar and characteristic "click" as it flew back and forth above the nest before alighting. This call note never failed to excite the little creature to the utmost. As the adult alighted at the edge of the nest the young bird produced a series of guttural chirps, and braced itself back on its legs and tail in preparation for receiving the long expected breakfast.

The food is transferred from the pouch-like gullet of the adult to that of the young by a process of regurgitation. This transfer of food is accompanied by a series of gulps, strains, and wrigglings of the head and neck on the part of both birds.

By the 40th day the young is completely feathered, but down still shows about the region of the head and rump. The tail feathers are now prominent and each shows a black spot near the end of the vein. Ten days later the down is frayed away and the plumage assumes the typical markings of the immature phase of plumage. The black markings are most evident on the wing coverts, scapulars, and inner secondaries, the regions which are destined to become black in the adult. The bill now has a distinctly yellowish color, which continues to deepen to reddish-orange in the older adult birds. From the 50th day (Plate XI, fig. 19) to the 60th day (Plate XI, fig. 20) the black areas of the coverts and secondaries become more continuous, while the black barring of the crown and back become diminished, or rather obscured, by the white tips of the growing feathers. The relative proportions between the wings and the tail have undergone a great change and now approach those of the adult.

The young birds are unable to fly well when they leave the nest, although the wings have been exercised very frequently for some weeks. Those which I observed leaped into the water from the edge of the nest and then made their way out to sea by paddling.

The young birds flopped their wings vigorously, as if attempting to fly, but were never able to rise from the water during the time I observed them. Such an event created considerable excitement among the adult Tropic-birds, which assembled to witness the affair. The young bird while thus floating on the water may be fed by the adults, but more probably depends on its stored fat until it gains enough strength to fly and fish for itself.

IV. EXPLANATION OF PLATES.

PLATE III.

Fig. 1. One-Rock Island, a typical island of Great Sound nearly covered with second growth cedars, a few palmettos, and cactuses. Five of the cavities on this side of the island were occupied by nesting birds.

Fig. 2. A close view of one of the cliffs on the outer shore of Morgan's Island, Ely's Harbor. The lower nest is 6 feet above high water mark.

PLATE IV.

Fig. 3. Adult Tropic-bird in the act of leaving her nest at One-Rock Island. This view shows how the wings may be used in locomotion on land, especially on rough uneven surfaces.

Fig. 4. Adult Tropic-bird on her nest at Tucker's Town. The nest was excavated, probably by the birds themselves, in the side of one of the high sand dunes which run along the shore. The long tail feather is bent over the back of the bird.

PLATE V.

Fig. 5. Adult Tropic-bird resting in a natural cavity of the cliffs at Bethel's Island.

Fig. 6. Adult Tropic-bird on her nest and egg at Morgan's Island. This nest is made in a thick mat of sargassum which was deposited by the waves.

PLATE VI.

Fig. 7. Nest and egg of the Tropic-bird at Tucker's Town. Same nest as shown in Plate IV, fig. 4. The egg gave the following measurements: longest diameter 4.9 cm., shortest diameter 3.6 cm., weight 37 grams. The markings on this egg are distributed with comparative uniformity.

Fig. 8. Egg of the Tropic-bird at Two-Rock Island. The measurements

are: longest diameter 5.6 cm., shortest diameter 4.1 cm., weight 40.9 grams.

Fig. 9. Egg pipped and some of the calcareous shell broken away. The shell membrane, however, is intact except where it is pierced by the beak of the embryo. The measurements are: longest diameter 5.4 cm., shortest diameter 3.9 cm., weight before being pipped 44 grams.

Fig. 10. Same egg as shown in fig. 9, but after the shell membrane had been ruptured. In photographing, the head was slightly pulled out to bring the beak into view. The dark patch of down on the crown is noteworthy.

PLATE VII.

Fig. 11. Young Tropic-bird. Age 12 hours; length 11.9 cm.; extent 11.2 cm.; wing 1.6 cm.; foot 2.8 cm.; bill 1.2 cm.; weight 25 grams before receiving any food. Down white, excepting that the crown, regions of wings, rump, and a patch on the back of the neck are tinged with dusky or dull gray. The black skin is naked at the base of the beak, on the lores, on the feet, and on the legs as far up as the heel. The beak and tarsus are a light bluish slate color, the toes and webs of a very much darker slate color. The eyes remain closed for a period of two days.

Fig. 12. Young Tropic-bird. Age 4 days; length 12.7 cm.; extent 11.9 cm.; wing 1.8 cm.; bill 1.3 cm.; foot 2.8 cm.; weight 35 grams. The bird at this age has its eyes open and is very alert and active. The down of the breast is much shorter and thicker than that of other parts of the body. The beak remains a bluish slate color like that of the freshly hatched bird. The oil-gland tubercle is present, but is not yet functional.

PLATE VIII.

Fig. 13. Young Tropic-bird with natural rock background. Age 8 days; length 16.1 cm.; extent 16.7 cm.; wing 2.5 cm.; foot 3.6 cm.; bill 1.4 cm.; weight 92 grams. No feathers have as yet appeared. The legs in their relation to the body have a noticeably posterior position.

Fig. 14. Young Tropic-bird. Age 15 days; length 20.1 cm.; extent 25.4 cm.; wing 3.5 cm.; foot 4.7 cm.; bill 2.0 cm.; weight 145 grams. The various darker regions of the down mentioned in the description of the freshly hatched young are still present, but do not seem to be so sharply differentiated. There is very little down on the sides of the body beneath the wings. In the scapular region have appeared the sheaths of the first quill feathers. These sheaths with their downy tips measure 1 cm. in length. The oil-gland tubercle is now well developed and has two openings, through which the oil exudes when the gland is squeezed. There is no down immediately around the tubercle, but a circlet of hair-like feathers is appearing around its base.

PLATE IX.

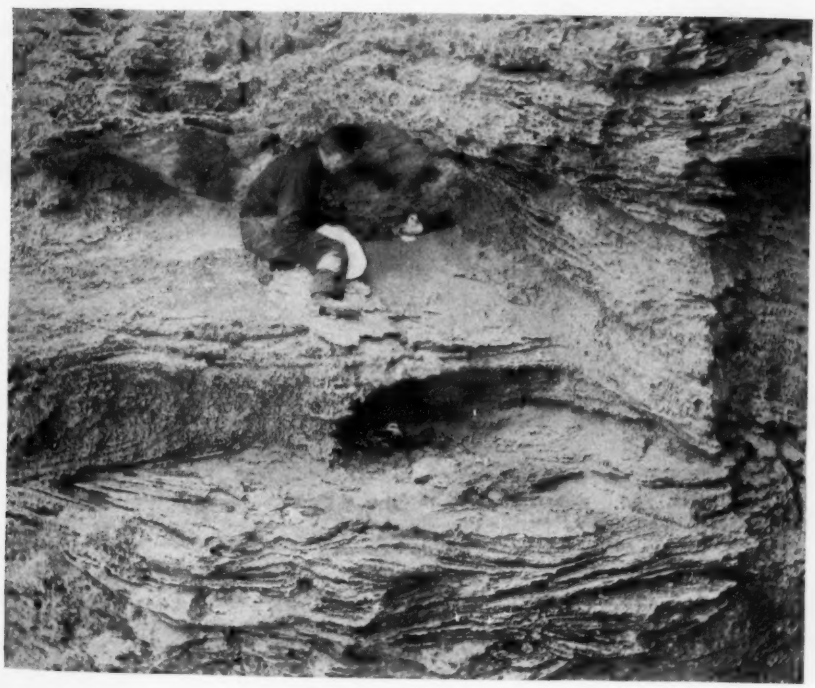
Fig. 15. Young Tropic-bird. Age 20 days; length 22.9 cm.; extent 32.5 cm.; wing 5.5 cm.; bill 2.4 cm.; foot 5.4 cm.; weight 232 grams. This view was taken from a position above the bird in order to show the expanded, barred tips of the first feathers in the scapular region. The sheaths of the feathers of the wings, tail, interscapular region, and breast are appearing through the skin. The skin about the base of the mandibles and lores is dotted with the papillæ of developing feathers.

Fig. 16. Young Tropic-bird. Age 24 days; length 24.3 cm.; tail 1.0 cm.; extent 37.6 cm.; wing 6.9 cm.; bill 2.9 cm.; foot 5.6 cm.; weight 250 grams. The quill feathers have pierced or are piercing nearly every part of the body where such feathers occur. The quills of the primaries and secondaries are so heavily charged with blood that the bird is unable to support its wings continuously, but allows them to rest on the floor of the nest. The tips of the secondaries are expanded and these feathers now range from 2 cm. to 3 cm. in length. The prinaries are not as far advanced as the secondaries. The tail feathers are much slower in their growth than the wing feathers, but at this stage the entire 12 are present. The two feathers destined to become the long tail feathers of the adult are already much longer than the others. These central feathers are 1 cm. in length, but with the tufted downy tips they measure 2.2 cm. The feathers of the breast have expanded tips, but they do not as yet show through the thick mass of down.

PLATE X.

Fig. 17. Young Tropic-bird. Age about 34 days; length 29.8 cm.; tail 3.8 cm.; extent 57.8 cm ; wing 11.5 cm.; bill 3.7 cm.; foot 6.0 cm.; weight 357 grams. The bird at this age, with its alternate areas of down and feathers, and its queer actions, presents a very ungainly and awkward appearance. The feathers in the region of the wings have undergone marked development and now appear as a continuous area of barred plumage. The primaries are white excepting the outer five, which have a black spot or patch in the vein near the tips of the feathers. The secondaries are white excepting the innermost 3 or 4, which are barred with black. The wing coverts are also barred with black. The feathers of the middle of the back are appearing, but are hidden from view by the feathers of the scapular region. The tips of the secondaries and coverts extend back nearly to the region of the oil gland, which is well developed at this stage. The shafts of the tail feathers are black, and each feather shows a black spot near the tip of the vane. The pure white feathers of the breast are well expanded, and replace the mat of down, which has gradually frayed away giving place to this more substantial protective covering. The feathers of the flanks are striped and barred with black as in the adults.

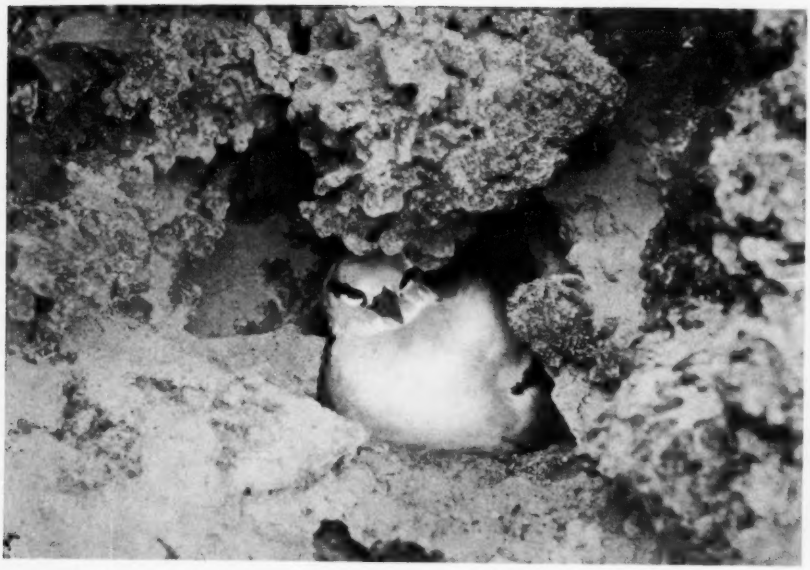
1. ONE-ROCK ISLAND.



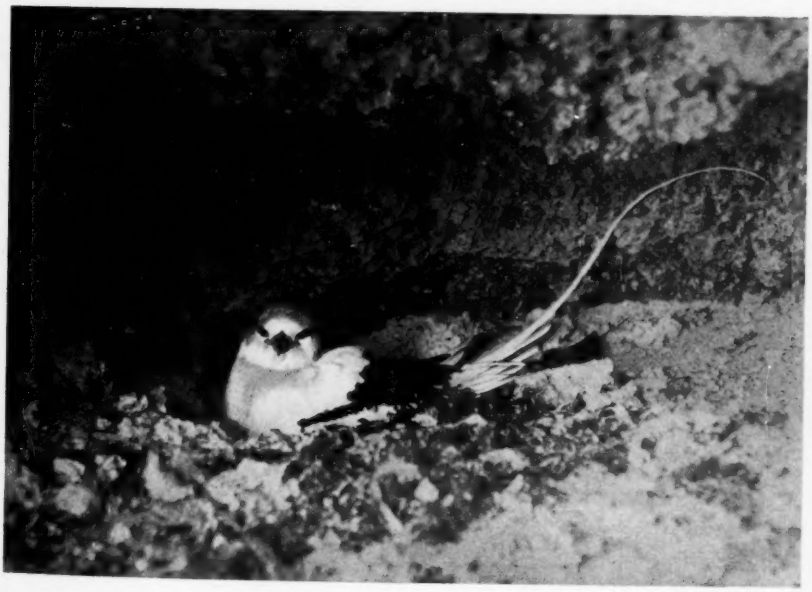
2. CLIFF, MORGAN'S ISLAND.

3. ADULT TROPIC-BIRD LEAVING NEST.

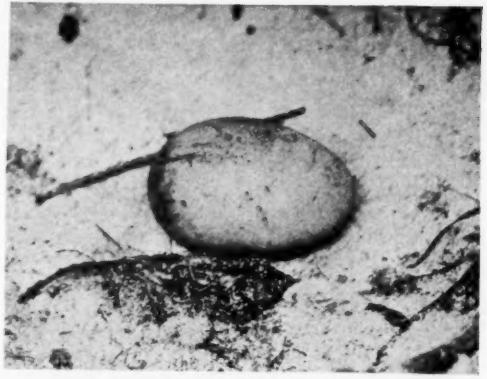
4. ADULT TROPIC-BIRD ON NEST.



5. ADULT TROPIC-BIRD RESTING IN A NATURAL CAVITY.



6. ADULT TROPIC-BIRD ON NEST.



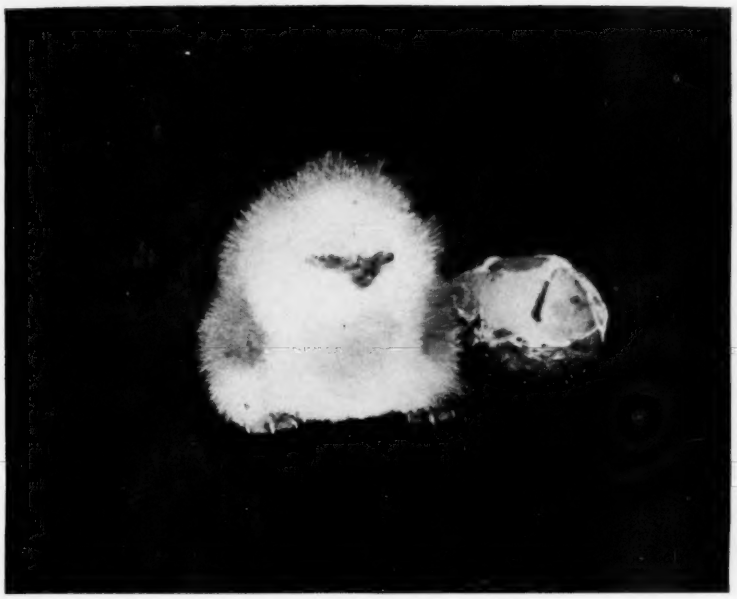
7

8

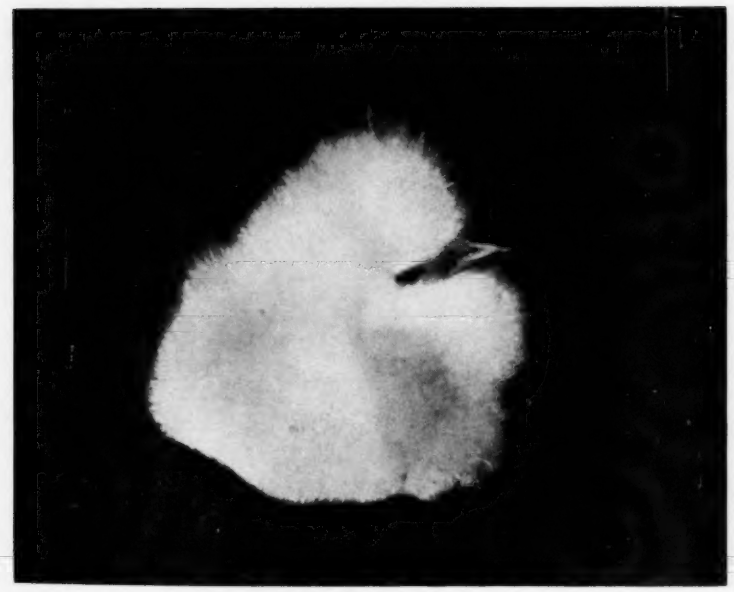
7, 8. EGGS OF TROPIC-BIRD.

9. PIPPED EGG OF TROPIC-BIRD.

10. SAME EGG WITH SHELL MEMBRANE RUPTURED.

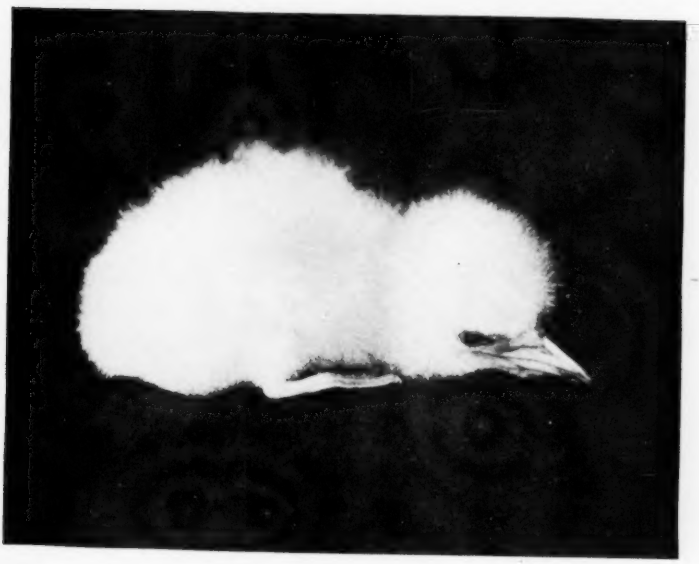


11. YOUNG TROPIC-BIRD 12 HOURS OLD.

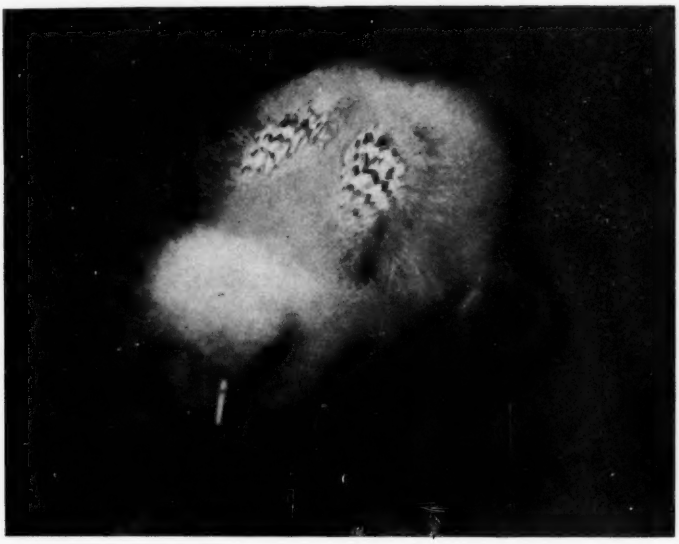


12. YOUNG TROPIC-BIRD 4 DAYS OLD.

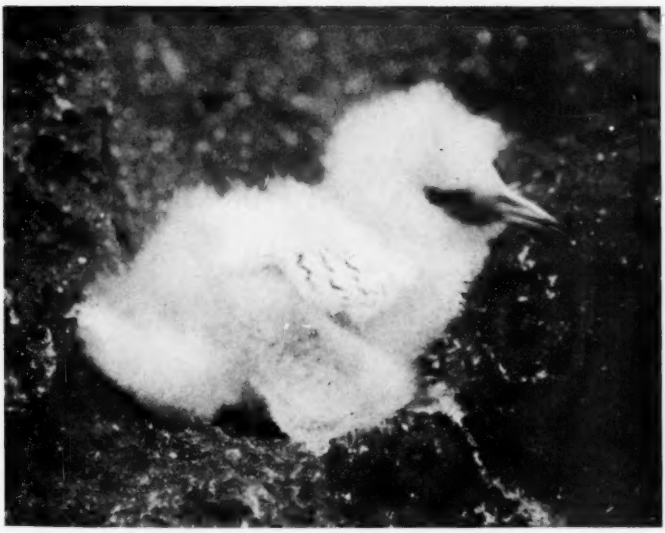
13. YOUNG TROPIC-BIRD, 8 DAYS OLD.



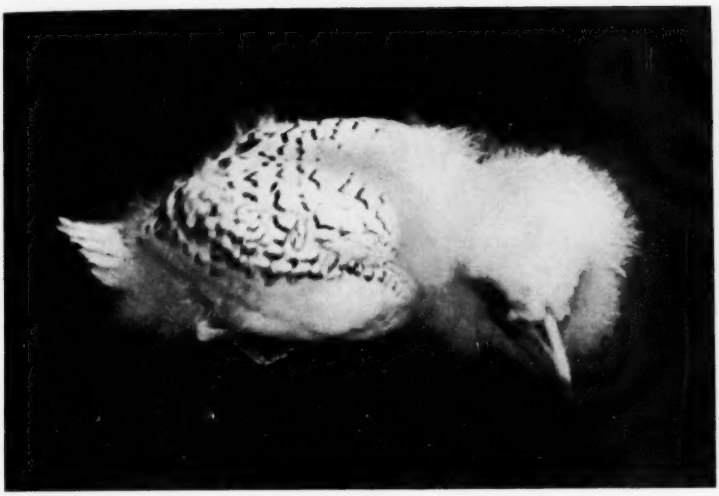
14. YOUNG TROPIC-BIRD, 15 DAYS OLD.



15. YOUNG TROPIC-BIRD, 20 DAYS OLD.



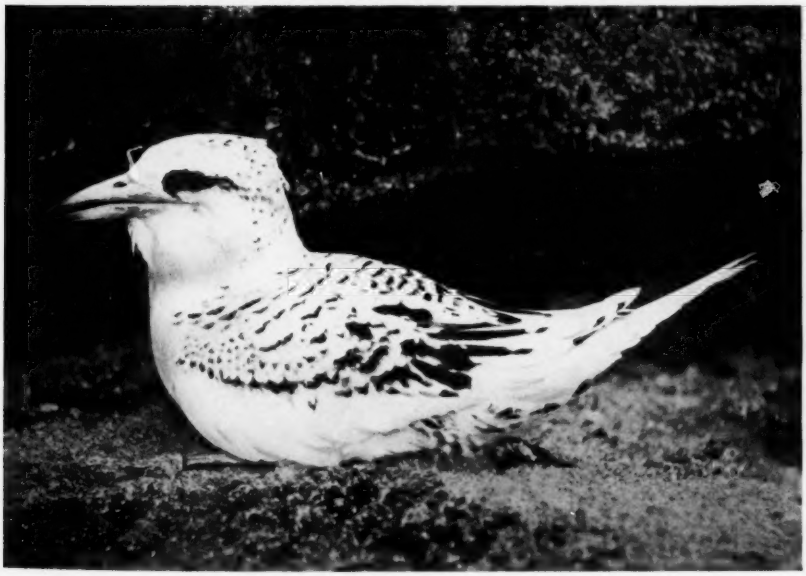
16. YOUNG TROPIC-BIRD, 24 DAYS OLD.



17. YOUNG TROPIC-BIRD, ABOUT 34 DAYS OLD.

18. YOUNG TROPIC-BIRD, ABOUT 37 DAYS OLD.

19. IMMATURE TROPIC-BIRD, ABOUT 52 DAYS OLD.



20. IMMATURE TROPIC-BIRD, ABOUT 60 DAYS OLD.

The feathers of the head are beginning to show through the skin. The white hair-like feathers of the auricular region now measure about 0.8 cm. in length, but are hidden from view by the mass of down on the sides of the head.

Fig. 18. Young Tropic-bird. Age about 37 days; length 31.5 cm.; tail 4.5 cm.; extent 60.2 cm.; wing 13.1 cm.; bill 3.8 cm.; foot 6.2 cm.; weight 377 grams. Except for a slight advance in development of plumage, the description of the bird shown in fig. 17 will also apply to this one. This figure, however, shows the plumage of the head and breast to much better advantage. Feathers now completely hide the black skin at the base of the upper mandible, and lores, which were devoid of feathers and down until the 20th day of development. The black loral spot, which is present in the adult, is here distinctly differentiated from the white and its appearance forms an important epoch in the development of the plumage.

PLATE XI.

Fig. 19. Immature Tropic-bird. Age about 52 days; length 40.6 cm.; tail 11.2 cm.; extent 82.4 cm.; wing 22.2 cm.; bill 4.4 cm.; foot 6.5 cm.; weight 497 grams. The primary covering of down is completely replaced by the plumage of the advanced immature bird when the young attains the age of 50 days. This view was taken to show the black markings of the feathers of the flanks, back, and head. The bill now has a pale yellowish color.

Fig. 20. Immature Tropic-bird. Age about 60 days; length 42.6 cm.; tail 13.7 cm.; extent 86.1 cm.; wing 24.6 cm.; bill 4.6 cm.; foot 6.6 cm.; weight 467 grams. This figure shows the bird in the final and splendid development of body and plumage which it attains before leaving the nest. To acquire the plumage of the adult only slight modifications are necessary, viz.: the disappearance of the black bars of the crown and upper parts of the body and the condensation of the black areas in the region of the wing coverts and secondaries. Two days later, at 62 days of age, this bird left the nest.

A SHORT SUMMER OUTING IN NEWFOUNDLAND, 1911.

BY EDWARD ARNOLD.

IN 1894 the writer made a collecting trip through the Canadian Provinces of Manitoba, Saskatchewan, and Alberta, and enjoyed the novel experience so much that for nine years following he put in a good part of the months of May and June enjoying field work in Saskatchewan and Alberta, despite mosquitoes and other winged pests, which flourish so abundantly during the early summer in those localities; during those years taking many sets of Richardson's Pigeon Hawk (*Falco columbarius richardsoni*), Sprague's Pipit (*Anthus spraguei*), Nelson's Sparrow (*Passerherbulus nelsoni nelsoni*), Leconte's Sparrow (*Passerherbulus lecontei*), Baird's Sparrow (*Ammodramus bairdi*), Marbled Godwit (*Limosa fedoa*), Western Willet (*Catoptrophorus semipalmatus inornatus*), Upland Plover (*Bartramia longicauda*), Avocet (*Recurvirostra americana*), Piping Plover (*Ægialitis meloda*), Wilson's Phalarope (*Steganopus tricolor*), Black-necked Stilt (*Himantopus mexicanus*), Woodcock (*Philohela minor*), Killdeer (*Oxyechus vociferus*), also about twenty different kinds of ducks, besides many other species too numerous to mention here.

The years 1905, 1906, 1907, found me during the months of June studying the nesting habits of Kirtland's Warbler (*Dendroica kirtlandi*) in Northern Michigan, my home State. In April, 1908, I moved to Montreal and the following year took such sets as Sharp-shinned Hawk (*Accipiter velox*), Broad-winged Hawk (*Buteo platypterus*), Savanna Sparrow (*Passerculus sandwichensis savanna*), Slate-colored Junco (*Junco hyemalis hyemalis*), and other birds of various kinds found nesting in the vicinity of Montreal and adjacent townships. In my collecting trips around Montreal I was frequently accompanied by my friend Mr. W. J. Brown, an enthusiastic field naturalist, who has accumulated a very fine collection of sets of eggs of the local birds found breeding in the Province of Quebec. Mr. Brown and myself often discussed Newfoundland as a desirable field to explore and our plans were finally made to put in the early part of the season of 1911 collect-

ing there, our special desiderata being sets of Fox Sparrows (*Passerella iliaca iliaca*), Greater Yellow-legged Plover (*Totanus melanoleucus*), Pigeon Hawk (*Falco columbarius columbarius*), Tennessee Warbler (*Vermivora peregrina*), and Ruby-crowned Kinglet (*Regulus calendula calendula*). We left Montreal via the Intercolonial Railway and after a pleasant ride through the Provinces of Old Quebec, New Brunswick, and Nova Scotia, arrived at North Sydney, Mr. Beers, of Bridgeport, Conn., accompanying us, having met us en route. There we boarded a steamer for Port aux Basques, Newfoundland, a distance of 110 miles. The trip was very rough and many of the passengers were sea sick. We arrived at Port aux Basques early the next morning — weather foggy and lots of ice and snow discernible on the bleak forbidding shores.

The summer there is short. On our journey over the Reid-Newfoundland Railway ice and snow could often be seen from the car window and during the first week of June the bushes and trees were just beginning to show the green of the opening leaves. Along the Humber River we picked fine bunches of trailing arbutus, which was just in its prime the first week in June. On the upper levels, during the early part of June, water froze every night, forming on edge of ponds a small coating of ice each morning. The snow was from three to six feet deep on the sides of the hills and we could walk on the top of it until 9 or 10 o'clock without sinking in over an inch or two. Notwithstanding this cold weather many birds had made their nests; some had laid their eggs, and others had young or were incubating their eggs,— such species as the Fox Sparrow (*Passerella iliaca iliaca*), Savanna Sparrow (*Passerculus sandwichensis savanna*), Least Sandpiper (*Pisobia minutilla*), Greater Yellow-legs (*Totanus melanoleucus*), Wilson's Snipe (*Gallinago delicata*), Welch's Ptarmigan (*Lagopus welchi*), were already incubating their eggs, and a Myrtle Warbler (*Dendroica coronata*) was building close to our camp. The Ruby-crowned Kinglets (*Regulus calendula calendula*) were in full song; the bird considering its size is a marvellous, rich singer, its note being a distinctive feature of every place we stopped to collect or make observations.

The Reid-Newfoundland is narrow gauge, but very comfortable, dining and sleeping cars are carried on all passenger trains; the

meals are very good and the service excellent. Mixed trains are also in service on alternate days. The road runs through a most picturesque territory. Generally speaking, the physical features of the island are of a rocky, mountainous, barren nature, comprising vast stretches of spruce woods and bogs, well watered in many places by streams, lakes or ponds, large and small. Fire has devasted many localities on both sides of the Humber River, leaving unsightly stretches of blackened skeletons of once handsome trees.

The fishing is excellent in all the streams and in many of the ponds and lakes, trout and salmon rising freely to the fly.

The Fox Sparrow (*Passerella iliaca iliaca*) is a common resident breeder, large, conspicuous and handsome, a vigorous sweet singer heard at all hours of the day and at times at sunset. Its clear, rich bell-like notes rise among the evergreen woods filling the air with delicious melody, beginning lustily and at length closing softly, frequently drowned by the music of the wind in the tree tops. This species is an early breeder. We found young in the nests and others flying around during the first week in June. We located a few nests with young in different stages of growth and also later nests containing in each instance but three eggs — which appears to be the normal complement in almost every instance. The nests are made of grass, moss, rootlets, twigs, etc., the lining fine hay, rootlets, caribou hair, etc., and are usually placed on the ground at the foot of a small spruce, sometimes from 2 to 5 feet up in the branches of spruce trees. The eggs are greenish, spotted and blotched with reddish brown of various shades, in some instances so heavy and numerous that the ground color is almost obscured. It is the characteristic sparrow of the island and in evidence at many points along the railway. We thoroughly enjoyed the beautiful bell-like notes of the Hermit Thrush and White-throated Sparrow, found quite common at many of our stopping places. Greater Yellow-legs (*Totanus melanoleucus*), Least Sandpiper (*Pisobia minutilla*), and Wilson's Snipe (*Gallinago delicata*), were the waders most in evidence, especially on the elevated plateaus in the vicinity of the small lakes and ponds. The Greater Yellow-legs (*Totanus melanoleucus*) is very noisy and frequently followed us persistently, yelping its alarm notes.

The notes of the Wilson's Snipe (*Gallinago delicata*) could be heard at all hours of the night and often during the day. We flushed a number of these birds and found several nests with eggs or young in the vicinity of the nest. Spotted Sandpipers (*Actitis macularius*) were frequently in evidence and breeding.

As a result of our trip we observed the following birds and obtained nests and eggs as given below:

1. **Gavia immer**. LOON.— One pair seen on a small pond on June 6. At this date the birds had not started to lay.

2. **Cepphus grylle.** BLACK GUILLEMOT.— Fairly abundant. Breeding on the "banks" on June 10.

3. **Larus hyperboreus**. GLAUCOUS GULL.— Common. Several pairs had their nests built out on large boulders in the center of ponds, but as the water was very cold and over our heads in depth, we could not examine them.

4. **Larus marinus**. GREAT BLACK-BACKED GULL.— Generally distributed along the western coast and breeding. A few pairs were found nesting on small islands in ponds adjacent to the Bay of Islands on June 10.

5. **Larus argentatus.** HERRING GULL.— Common resident. Observed everywhere off the "Banks" of Newfoundland, but their numbers are being rapidly decimated by the fishermen.

6. **Sterna hirundo**. COMMON TERN.— We saw a small colony at Bay of Islands on June 7. At this date they apparently had not started to build.

7. **Oceanodroma leucorhoa**. LEACH'S PETREL.— Several burrows of this species were located on an island June 10, but as the holes invariably ran under a large rock, a pickaxe was necessary to examine the contents.

8. **Mergus americanus**. MERGANSER.— Nest found May 19 on the banks of the Humber River, containing nine fresh eggs.

9. **Clangula clangula americana**. GOLDEN-EYE.— Nest containing eight fresh eggs found in a dead tree near the Humber River on May 21.

10. **Somateria dresseri**. EIDER.— Saw two birds of this species at St. Georges Bay on June 9.

11. **Branta canadensis canadensis**. CANADA GOOSE.— Common breeder. At the time of our visit the young were already hatched and when they were approached the anxious parents were heard "honking" in the vicinity.

12. **Botaurus lentiginosus**. BITTERN.— One individual heard "pumping" on June 1 and was undoubtedly breeding.

13. **Gallinago delicata**. WILSON'S SNIPE.— A very abundant species and noted wherever there was bog. Birds were heard overhead continuously from 9.30 P. M. to 4.30 A. M., June 9. A nest containing three fresh eggs was found on a mound in a spruce bog on June 8. On June 12 another

was located where the young had just left, as evidenced by the egg shells lying about.

14. **Pisobia minutilla**. LEAST SANDPIPER.— Common. Several nests examined between June 3 and 16; one had three eggs and two others had four eggs each in various stages of incubation. The sets were simply laid in depressions in moss off the margins of "ponds."

15. **Totanus melanoleucus**. GREATER YELLOW-LEGS.— Saw a number on the elevated plains where the bird's harsh cries may be heard at times. A nest of this species was found on June 3 with four badly incubated eggs, which were simply laid on a hill adjoining a large tract of spruce bog. On June 13 two others were discovered in a similar location, four handsomely marked eggs being the complement in each case.

16. **Totanus flavipes**. YELLOW-LEGS.— Saw several individuals on the barrens, but no nest was found.

17. **Actitis macularius.** SPOTTED SANDPIPER.— Common along the shores of lakes and streams, and breeding abundantly.

18. **Lagopus welchi**. WELCH'S PTARMIGAN.— In a dry place in a large area of spruce bog, and at one of the highest points reached by the railway, we flushed a bird of this species off her nine fresh eggs on June 6. The nest was merely a depression in moss amongst spruce sprouts and thinly lined with feathers and grasses. Two other birds were seen on the barrens in the same neighborhood, but investigation failed to reveal any more nests.

19. **Astur atricapillus atricapillus**. GOSHAWK.— We saw a few in the mountain regions, but they are not very common.

20. **Falco columbarius columbarius**. PIGEON HAWK.— On June 6 a noisy pair were located in some heavy spruce timber at the base of a small precipice. After carefully looking for the nest in the trees, it was eventually found with four young on a ledge of rock on the mountain side.

21. **Pandion haliaëtus carolinensis**. OSPREY.— Not numerous. A few birds seen flying from the sea inland. A breeding resident.

22. **Ceryle alcyon**. BELTED KINGFISHER.— Fairly common along the Humber River, where a nest of seven fresh eggs was taken on July 1.

23. **Dryobates villosus terrænovæ**. NEWFOUNDLAND WOODPECKER.— Common in the mountainous country and breeding in large dead birch trees which have been charred by forest fires.

24. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— Probably common, but we only saw half a dozen.

25. **Picoides arcticus**. ARCTIC THREE-TOED WOODPECKER.— Saw three birds in the higher levels.

26. **Colaptes auratus luteus**. NORTHERN FLICKER.— Common. Flushed one bird out of a hole in a dead birch on June 9. The nest contained young.

27. **Chordeiles virginianus virginianus**. NIGHTHAWK.— Saw a number flying over the cliffs at Bay of Islands.

28. **Tyrannus tyrannus**. KINGBIRD.— A few specimens were seen along the shore of the Humber River.

29. **Empidonax trailli alnorum**. ALDER FLYCATCHER.— This species apparently had just arrived about June 10 at Bay of Islands and a few days later were quite common.

30. **Empidonax minimus**. LEAST FLYCATCHER.— A few birds seen and heard along the Humber River.

31. **Perisoreus canadensis nigricapillus**. LABRADOR JAY.— A pair or more of these birds were observed at every point and a few of them used to feed around our camp.

32. **Corvus corax principalis**. NORTHERN RAVEN.— Fairly common, especially in and about the Bay of Islands. One pair had their nest of sticks on the cliffs of Gregory Island, but the young had already left June 8.

33. **Corvus brachyrhynchos brachyrhynchos**. CROW.— We saw a few birds along the railway line.

34. **Euphagus carolinus.** RUSTY BLACKBIRD.— A nest containing four fresh eggs found June 4. It was placed five feet up in a small spruce at edge of pond.

35. **Pinicola enucleator leucura.** PINE GROSBEAK.— Several old nests of this species were found; the birds are fairly common.

36. **Loxia curvirostra minor.** CROSSBILL.— Saw two individuals at Bay of Islands.

37. **Acanthis linaria linaria.** REDPOLL.— Saw a flock of six or seven near the Humber River on June 7.

38. **Passerculus sandwichensis savanna.** SAVANNAH SPARROW.— Abundant and nesting in spruce bogs. Several nests found on June 17 sunk in caribou moss and lined with grasses. This bird was also nesting on an island many miles out at sea.

39. **Zonotrichia leucophrys leucophrys**. WHITE-CROWNED SPARROW.— We saw but three birds in stunted spruce woods.

40. **Zonotrichia albicollis**. WHITE-THROATED SPARROW.—A common resident and abundant breeder. Many nests found on the ground in spruce woods during the month of June, the sets ranging from two to four eggs.

41. **Spizella monticola monticola**. TREE SPARROW.— A few birds seen at Bay of Islands in the spruce woods.

42. **Spizella passerina passerina.** CHIPPING SPARROW.— Common, especially at Bay of Islands.

43. **Junco hyemalis hyemalis**. SLATE-COLORED JUNCO.— Not many birds seen. A nest with three incubated eggs was located on the ground in spruce woods on July 18.

44. **Melospiza lincolni lincolni**. LINCOLN'S SPARROW.— A few seen along the Humber River.

45. **Melospiza georgiana**. SWAMP SPARROW.— Only two birds noted.

46. **Passerella iliaca iliaca**. FOX SPARROW.— A very interesting and abundant species; a wonderful singer. This bird's flute-like notes were heard at all times of the day in the stunted spruce country.

47. **Iridoprocne bicolor**. TREE SWALLOW.— We saw several specimens at St. Georges Bay.

48. **Riparia riparia**. BANK SWALLOW.— Several pairs were starting to nest in some low-lying sand-pits at St. George's Bay on June 10.

49. **Mniotilta varia**. BLACK AND WHITE WARBLER.— A fairly common breeder. Nesting in spruce woods about June 15.

50. **Dendroica æstiva æstiva**. YELLOW WARBLER.— Several specimens noted at Bay of Islands amongst the alders on June 7. A nest with four badly incubated eggs was found on June 27 in a birch tree.

51. **Dendroica coronata**. MYRTLE WARBLER.— On June 9 we saw a bird of this species carrying nesting material. Not very common.

52. **Dendroica magnolia**. MAGNOLIA WARBLER.— Six or seven birds seen in the stunted spruce country along the Humber River on June 8.

53. **Dendroica pensylvanica**. CHESTNUT-SIDED WARBLER.— Rare — only two birds noted in some mixed woods on June 8.

54. **Dendroica castanea.** BAY-BREASTED WARBLER.— Two individuals noted at Grand Lake on June 8.

55. **Dendroica striata**. BLACK-POLL WARBLER.— The most abundant warbler seen during our visit. They were everywhere in the spruce country. A nest with four fresh eggs was found on June 27 in a small spruce tree.

56. **Dendroica virens.** BLACK-THROATED GREEN WARBLER.— Heard many in the large hemlocks and pines at Bay of Islands on June 10.

57. **Dendroica palmarum hypochrysea.** YELLOW PALM WARBLER. — We heard this species singing every morning early around our camp at Grand Lake.

58. **Seiurus noveboracensis noveboracensis**. WATER-THRUSH.— Fairly abundant. A nest found on June 4 in the upturned roots of a tree. The bird had not started to lay.

59. **Geothlypis trichas trichas**. MARYLAND YELLOW-THROAT.— Common among the alders and willows along the Humber River.

60. **Wilsonia pusilla pusilla.** WILSON'S WARBLER.— Common and observed wherever we pitched our camp.

61. **Wilsonia canadensis.** CANADA WARBLER.— Fairly common in the spruce woods.

62. **Nannus hiemalis hiemalis**. WINTER WREN.— Heard this species singing at all hours of the day in damp evergreen woods.

63. **Sitta canadensis**. RED-BREASTED NUTHATCH.— Saw several in the mountainous country where they were breeding.

64. **Penthestes atricapillus atricapillus.** CHICKADEE.— Common all over the country.

65. **Regulus calendula calendula**. RUBY-CROWNED KINGLET.— Very abundant. This species, like *Passerella iliaca*, is a very interesting one and a delightful singer. For such a small body the bird has extraordinary powers of song, and from the tops of stunted spruce can be heard at all hours of the day.

On June 4 a nest with four fresh eggs was found. On June 9, 15 and 28, three others of nine eggs each, respectively, were discovered, all the nests being suspended from the branches of stunted spruce trees. They were built of moss, fine strips of bark and heavily lined with feathers of various birds.

66. **Hylocichla fuscescens fuscescens.** VEERY.— Not as common as the following species, but a few were seen at different points.

67. **Hylocichla guttata pallasi.** HERMIT THRUSH.— Abundant. A nest found on June 4 contained three fresh eggs. Two other nests were located June 14 and 16, each containing three fresh eggs. Another wonderful singer. It was worth making the trip just to hear the present species, the White-throated Sparrow, the Fox Sparrow and Ruby-crowned Kinglet sing their beautiful notes.

68. **Planesticus migratorius migratorius.** ROBIN.— Abundant everywhere. Nesting commonly the first week in June.

NOTES ON BIRDS BREEDING IN THE MOUNTAINS OF VIRGINIA.

BY H. B. BAILEY.

DURING a trip to the mountains of Virginia in July and August, 1910, I was struck by the large number of young birds seen daily on my tramps, and as many species were supposed to raise only one brood in our hot climate, I decided this season to find as many evidences of actual second and third broods as possible. With this object in view I visited Goshen the first week in June and was surprised to find every species had hatched their young and many laying again, thus being as far advanced as at our home on the seaboard. The following notes were made at Goshen, June 3–10; Massanetta Springs (near Harrisonburg), July 7–28, and August 16–30; Hot Springs, July 29–August 4; Old Sweet Springs (one mile over the border in West Virginia), August 6–15. The elevation is over 2000 feet, and the season was very hot and dry. Well kept farms predominate, the woods having generally been cut off. My principal disappointment was in not finding Juncos and Thrushes on the mountain tops. The species observed (especially

sparrows) were very abundant and our noble Virginia certainly did her share towards increasing the bird population. In the mountains Wild Turkeys, Ruffed Grouse, fox squirrels, foxes and wild cats are common. From the descriptions given me by farmers' boys, Eagles and Duck Hawks breed on the cliffs.

The following list is very incomplete but may form the nucleus for other observations during the heated term some future year.

1. **Aix sponsa.** WOOD DUCK.— Not rare. Saw young about half grown, July 10.

2. **Butorides virescens.** GREEN HERON.— Common; probably raises two broods.

3. **Philohela minor.** WOODCOCK.— Rare. Seen July 24. Boys say they nest in March.

4. **Actitis macularius.** SPOTTED SANDPIPER.— Not common; old and young together in June, July 14 and in August.

5. **Oxyechus vociferus.** KILLDEER.— Quite common; young flying July 10.

6. **Colinus virginianus virginianus.** BOB-WHITE.— Abundant. Owing to the dry weather the young were two thirds grown July 7; second settings of eggs were destroyed July 29 when hay fields were cut, but the birds immediately went to laying again. They always desert the nest when cut around, even if a piece of cover is left over the nest. On August 25 a covey of young just able to fly was observed.

7. **Bonasa umbellus umbellus.** RUFFED GROUSE.— Covey of young July 10. Not rare on mountains.

8. **Meleagris gallopavo silvestris.** WILD TURKEY.— Still common. I think much crossing is done in the wilder parts; many farmers are giving up the bronze variety, owing to their straying propensities.

9. **Zenaidura macroura carolinensis.** MOURNING DOVE.— Common. Young in all stages. July 16, fresh eggs.

10. **Cathartes aura septentrionalis.** TURKEY VULTURE.— Rather common; boys claim they build on the cliffs, and Buzzard roosts are common names on sides of several mountains.

11. **Catharista urubu.** BLACK VULTURE.— Commoner than the preceding.

12. **Accipiter velox.** SHARP-SHINNED HAWK.— Not common. July 10, nest with young ready to fly.

13. **Accipiter cooperi.** COOPER'S HAWK.— Not common. Several seen. Not a favorite with farmers.

14. **Buteo lineatus lineatus.** RED-SHOULDERED HAWK.— Breeds sparingly, and probably the Red-tailed Hawk also.

15. **Falco sparverius sparverius.** SPARROW HAWK.— Not common until August when young were full grown.

16. **Aluco pratincola.** BARN OWL.— One taken a few days before my arrival in an old barn.

17. **Strix varia varia.** BARRED OWL.— Rather common.

18. **Otus asio asio.** SCREECH OWL.— Common.

19. **Bubo virginianus virginianus.** GREAT HORNED OWL.— Common. Destructive to poultry where so many roost in trees, as very few farmers have regular houses for them.

20. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO. — Rare. Young hatched July 7.

21. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO.— Not common. Two broods; feeding young in August.

22. **Ceryle alcyon.** BELTED KINGFISHER.— Common. No signs of a second brood.

23. **Dryobates villosus auduboni.** HAIRY WOODPECKER.— Rare. Only one brood.

24. **Dryobates pubescens pubescens.** DOWNY WOODPECKER.— Two broods; small young in nest June 10.

25. **Phlœotomus pileatus pileatus.** PILEATED WOODPECKER.— Rarely seen; heard often, and one seen August 2.

26. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— Very common. Possibly three broods. July 7, nest contained eggs which hatched the 10th; young left the nest on the 20th; seen feeding young in August.

27. **Centurus carolinus.** RED-BELLIED WOODPECKER.— Not common. Only one brood.

28. **Colaptes auratus auratus.** FLICKER.— Common. Raises two broods.

29. **Antrostomus vociferus vociferus.** WHIP-POOR-WILL.— Raises two broods. Eggs, July 7; hatched 10th; not heard calling after 15th.

30. **Chordeiles virginianus virginianus.** NIGHTHAWK.— Two broods. Not heard after July 23.

31. **Chætura pelagica.** CHIMNEY SWIFT.— Very common. One nested inside of an old mill; young gone July 10.

32. **Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.—Abundant. No signs of second brood.

33. **Tyrannus tyrannus.** KINGBIRD.— Common; two broods.

34. **Myiarchus crinitus.** CRESTED FLYCATCHER.— Common. Feeding young in August.

35. **Sayornis phœbe.** PHŒBE.— Abundant. June 6, young in all stages and fresh eggs. July 7, young in nest; feeding young in August.

36. **Myiochanes virens.** WOOD PEWEE.— Undoubtedly two broods. Still singing Aug. 6.

37. **Empidonax virescens.** ACADIAN FLYCATCHER.— Rare. One heard and seen at Goshen in June and at Hot Springs in August; probably commoner in suitable localities near water.

38. **Empidonax minimus.** LEAST FLYCATCHER.— Rare. July 10 one heard and seen in an Orchard.

39. **Cyanocitta cristata cristata.** BLUE JAY.— Abundant. No signs of second brood.

40. **Corvus brachyrhynchos brachyrhynchos.** CROW.— Abundant. One brood — how fortunate!

41. **Molothrus ater ater.** COWBIRD.— Young birds common July 7; but I have never found their eggs in late settings.

42. **Agelaius phœniceus phœniceus.** RED-WINGED BLACKBIRD.— Very common. Young in nest July 7; eggs hatching July 15.

43. **Sturnella magna magna.** MEADOWLARK.— Common. Nest and eggs found July 20; destroyed by hogs; July 22–23, new nest, female flushed.

44. **Icterus spurius.** ORCHARD ORIOLE.— Common. Two broods.

45. **Icterus galbula.** BALTIMORE ORIOLE.— Rare; only one seen.

46. **Quiscalus quiscula æneus.** BRONZED GRACKLE.— Feeding young July 23.

47. **Astragalinus tristis tristis.** GOLDFINCH.— Abundant. No signs of breeding until Aug. 10, at Old Sweet Springs, when a nest with 4 eggs, and one with 6 eggs were found.

48. **Passer domesticus.** ENGLISH SPARROW.— Everywhere. Aug. 25, many young in nests in the top of an old shed.

49. **Poœcetes gramineus gramineus.** VESPER SPARROW.— Very common. Raises probably three broods. Large young June 6; fresh eggs July 7–17, Aug. 2, and young in nests.

50. **Ammodramus savannarum australis.** GRASSHOPPER SPARROW.— Very common. Large young flying June 10 and July 7; fresh eggs July 29; singing all through August.

51. **Passerherbulus henslowi henslowi.** HENSLOW'S SPARROW.— Very common at Massanetta; young abundant July and August; 3 eggs, July 16.

52. **Spizella passerina passerina.** CHIPPING SPARROW.— Abundant. Two and three broods; young in nests June, July and August.

53. **Spizella pusilla pusilla.** FIELD SPARROW.— Very common. Three broods. Eggs, July 27, August 1, August 20; young in nests June, July, and August.

54. **Melospiza melodia melodia.** SONG SPARROW.— Very common. Three broods. Eggs, July 9–27. Young hatched the 9th, left nest on the 20th; young in nests July and August.

55. **Pipilo erythrophthalmus erythrophthalmus.** TOWHEE.— Common. Two broods; feeding young July 10.

56. **Cardinalis cardinalis cardinalis.** CARDINAL.— Common. Young in nest July 27.

57. **Guiraca cærulea cærulea.** BLUE GROSBEAK.— Two or three broods; young in nest July 10–August 2.

58. **Passerina cyanea.** INDIGO BUNTING.— Common. Three broods. Young and eggs, June 6, and in July; feeding young August 1.

59. **Piranga erythromelas.** SCARLET TANAGER.— Rare at Goshen in June; rare at Hot Springs.

60. **Piranga rubra rubra.** SUMMER TANAGER.— Several seen in oak woods, in June and July.

61. **Progne subis subis.** PURPLE MARTIN.— Not many boxes are put up for them.

62. **Petrochelidon lunifrons lunifrons.**— CLIFF SWALLOW.— Only one colony on a barn by the river.

63. **Hirundo erythrogastra.** BARN SWALLOW.— Abundant. All nests were empty July 10.

64. **Riparia riparia.** BANK SWALLOW.— Only seen by the river.

65. **Bombycilla cedrorum.** CEDAR WAXWING.— Common. June, July, and August. No signs of building until a nest was found building July 29, in an orchard. August 4 contained four eggs.

66. **Vireosylva olivacea.** RED-EYED VIREO.— Very common. Eggs and young in June; mostly silent after July 10.

67. **Vireosylva gilva gilva.** WARBLING VIREO.— Rare.

68. **Lanivireo flavifrons.** YELLOW-THROATED VIREO.— Nest in maple July 15, young just leaving.

69. **Vireo griseus griseus.** WHITE-EYED VIREO.— Rather rare at Goshen in June; not heard afterwards.

70. **Mniotilta varia.** BLACK AND WHITE WARBLER.— Common. Not singing after June.

71. **Dendroica æstiva æstiva.** YELLOW WARBLER.— Very common, breeding near houses; still singing August 1.

72. **Dendroica vigorsi.** PINE WARBLER.— Common in pine woods; rarely heard in July.

73. **Dendroica discolor.** PRAIRIE WARBLER.— Common. Stopped singing July 13.

74. **Seiurus aurocapillus.** OVEN-BIRD.— Young in nest July 10; none singing later.

75. **Seiurus motacilla.** LOUISIANA WATER-THRUSH.— Heard singing at Hot Springs in a deep glen, August 4; common at Goshen in June.

76. **Geothlypis trichas trichas.** MARYLAND YELLOW-THROAT.— Rare at Goshen in June; not seen nor heard later.

77. **Icteria virens virens.** YELLOW-BREASTED CHAT.— Common. Stopped singing July 18.

78. **Wilsonia citrina.** HOODED WARBLER.— Common in June; none heard later on.

79. **Setophaga ruticilla.** REDSTART.— Rather rare. Not heard after July 10; feeding young August 4.

80. **Mimus polyglottos polyglottus.** MOCKINGBIRD.— Rare. Young in nest July 24; very common around Staunton July 28.

81. **Dumetella carolinensis.** CATBIRD.— Abundant. Three broods; young still in nest August 1.

82. **Toxostoma rufum.** BROWN THRASHER.— Very common. Young in nest July 17.

83. **Thryothorus ludovicianus ludovicianus.** CAROLINA WREN.— Not common. Eggs June 6; feeding young August 6.

84. **Thryomanes bewickii bewickii.** BEWICK'S WREN.— Rare. Young hatched June 3; singing in July.

85. **Troglodytes aëdon aëdon.** HOUSE WREN.— Common. Young in nest July 27.

86. **Sitta carolinensis carolinensis.** WHITE-BREASTED NUTHATCH. — Common. No signs of second brood.

87. **Sitta pusilla.** BROWN-HEADED NUTHATCH.— Rare at Massanetta in July; seen at Goshen in June.

88. **Bæolophus bicolor.** TUFTED TITMOUSE.— Rather common; large young in June.

89. **Penthestes carolinensis carolinensis.** CAROLINA CHICKADEE. — Common. Apparently raise only one brood.

90. **Polioptila cærulea cærulea.** BLUE-GRAY GNATCATCHER.— Common. Not singing after June 6.

91. **Hylocichla mustelina.** WOOD THRUSH.— Common. June 6, eggs and young in nest and flying; July 26, young in nest. Silent after July 15.

92. **Hylocichla fuscescens fuscescens.** VEERY.— Rare; heard only at Hot Springs, August 4.

93. **Planesticus migratorius migratorius.** ROBIN.— Very abundant; probably three broods.

94. **Sialia sialis sialis.** BLUEBIRD.— Abundant. Eggs hatching July 16, and large young, same date.

NOTES ON THE FLIGHT OF GULLS.

BY WILLIAM BREWSTER.

EVERY ornithologist knows, of course, that Gulls are past masters of the art of making headway against strong winds. These they commonly meet and overcome either by flying straight and rather low over the water, with frequent if not incessant wing beats, or by alternately soaring upward and swooping downward on set wings, apparently utilizing as much as possible the momentum acquired by such evolutions or by intermittent flapping, and seeming to follow, with admirable skill and judgment, the lines of least resistance. Under certain conditions, however, they progress by means other than those just mentioned and with surprising ease and celerity, as I have twice witnessed to exceptionally good advantage.

On the first occasion — October 6, 1909 — I was crossing from Liverpool to Boston in the Cunard steamship 'Ivernia' when, after passing the southeastern extremity of Ireland and laying our course to the westward, we were followed, as is usual in those waters, by a perfect swarm of Gulls — chiefly little Black-headed and Herring Gulls with a few Lesser Black-backed and Mew Gulls. Gliding, for the most part, on set and motionless wings close above and around us they kept up with us without apparent effort for a distance of more than one hundred miles although our ship was heading within two points of a heavy wind and ploughing through a tumultuous sea at a speed of sixteen miles an hour. There were nearly always a dozen or more of them floating not more than twelve or fifteen feet over our heads as we stood on the upper deck and keeping so nearly the same positions in relation to our own that whenever we regarded them intently, without taking note of other surroundings, it was difficult to realize that either they or we were not quite motionless. They looked, indeed, like so many admirably stuffed and mounted Gulls suspended by invisible wires. At such short distances and in bright sunlight I watched them for minutes at a time without detecting any movement of their wings, other than that due to occasional flexing or similarly slight readjust-

ment, while their vertical deflections from a horizontal plane of flight were never greater than ten or fifteen inches. Yet all the while the beautiful birds were keeping exact pace with us and moving at a known speed of sixteen miles an hour against a wind having an estimated velocity of considerably more than that. Nor was this the best that they could do for every now and then one which had fallen behind the rest would overtake its companions without flapping or other visible effort although going — perhaps for hundreds of yards — at almost double their rate of speed. How could such a thing be? It seemed unbelievable yet the fact was before our eyes and not to be discredited, however difficult to understand or explain. Those of us who first witnessed and afterwards discussed it agreed in thinking that the gliding birds could not acquire any considerable amount of their momentum by their slight and infrequent swoops or occasional wing strokes. Indeed they seemed, oddly enough, to lose rather than to gain headway whenever they flapped vigorously. It was suggested that their chief if not only means of propulsion must be that of the force of the wind, acting on their set wings somewhat as it does on the sails of a vessel, but objected that no sailing vessel can head within three points of the wind and move forward through the water or fail, when going to windward, to make more or less leeway; whereas the Gulls headed within two points and had no perceptible drift to leeward.

On August 2, 1911, I was again returning from England to America — this time in company with my friends Dr. and Mrs. Glover M. Allen — when our steamship, the White Star liner 'Arabic' was attended, during most of the afternoon and for a distance of above a hundred miles off the south coast of Ireland, by from fifty to two hundred Gulls, the number varying from hour to hour within these limits. Nearly all were adult Herring Gulls still in full nuptial plumage. A few followed the creamy wake of the ship or poised directly over her just to the rear of her smoke stack but the majority kept abreast of her to the windward side, the somewhat sheltered lee side being persistently avoided. On a level with her upper deck or a little above it, they were generally and rather evenly distributed — although more thickly in places than in others — all the way from her stern to amidships, some

keeping within a yard or two of the rail, others thrice that distance off, still others fifty or more yards out over the water. Their respective positions in relation to each other and to the ship were so accurately and systematically maintained that whenever I got one of them in line with any fixed object on the deck I could often hold it there, without myself moving again, for several successive minutes. At first, when the wind was coming from about two points off our larboard bow and blowing not more than twenty miles an hour, the Gulls flapped rather frequently although most of them glided on set wings the greater part of the time. As the afternoon wore on the wind shifted and freshened until it came within a point and a half of being dead ahead — in the opinion of our Boatswain — and attained a velocity of thirty-five miles an hour — according to our Captain. This change was gradual, not abrupt. It was accompanied by a marked and most interesting progressive change in the manner of flight and general appearance of the Gulls. As the gale increased they flapped their wings less and less often, until most, if not all of them, were gliding ceaselessly, minute after minute, over distances certainly exceeding a mile, without a single wing beat but not without changes or readjustments in the bend or the inclination of the wings which took place not infrequently and often were very obvious. It was a rarely impressive and beautiful, as well as mysterious, sight — that of this orderly throng of silent, stately, almost snow-white birds, moving majestically on a perfectly level plane, at a speed of fifteen knots an hour, against a raging wind, yet making no visible muscular effort which could in any way account for such progress. Even more surprising was it to see, every now and then, one of them leave the rest and, going two feet to their one, forge on ahead of them all perhaps to the bows of the steamer and beyond, yet without once beating its wings. They seemed, indeed, to now have abundant speed *held in reserve* and to be able to retard or accelerate it at will, without obvious means of so governing it. Dr. Allen, who watched them with me for a time but not, unfortunately, when the gale reached its height and they were doing their best, fully shared my conviction that they could not possibly be making use of previously acquired momentum but that the wind itself must furnish their chief if not only means of propulsion. After he had

gone below it shifted to almost dead ahead and blew for half an hour or more with extreme violence. The Gulls were now heading, I should say, within a point and a half of it yet continuing to sail into it with undiminished ease and speed. The gradual increase in its strength and in the duration of their gliding flights, was accompanied by a very noticeable progressive change in the way their wings were held. This is difficult to describe but essentially it may be said to have consisted (1) in the more backward set of the whole wing; (2) in the greater crooking or bending of the wing at the carpal joint; (3) in the much more decided downward trend of the flight quills, especially the secondaries, which were so bent down and forward towards their tips as to give the wing when viewed from in front a conspicuously incurved or hollowed aspect similar to that shown by Hawks, Pigeons, etc., caught by the camera in the act of "back-pedaling" just before alighting. At the height of the gale the Gulls' wings were held so very far to the rear of their usual position that very much of the body was shown in advance of where they seemed to join it. The neck, too, appeared to be exceptionally elongated and its contour plumage, with that of the head and body, unusually compressed. In other and briefer words the birds seemed to have advanced as far as might be their centres of gravity, to have reduced as much as possible the resistance offered by their heads, necks and bodies to the wind, and to be employing its force to drive them for miles, almost straight into it, by merely letting it beat against their rigid and peculiarly placed and adjusted wings. As I stood watching half a dozen or more of them only a few yards away, sailing serenely and impassively through gusts which forced me to cling with both hands to a railing to avoid being blown bodily across the deck, it occurred to me that their swift and effortless progress might be due, at least in part, to the impact of the wind on the terminal portions of their depressed and stiffly-held primaries and secondaries. That these were incessantly agitated and sprung upward by the wind was plainly to be seen. They must be similarly bent, of course, whenever there are strong, downward strokes of the wings. Photographs of large, slow-flapping birds engaged in ordinary flight, fail to indicate that such wing strokes are often directed sufficiently backward to be altogether or even largely in the nature of rowing movements. On

experimenting with severed wings stiffened by drying I have found that when held firmly in the hand by their outer (*i. e.* bony) edges and struck smartly downward they give one very decidedly the impression that there is a resultant and by no means inconsiderable *level* thrust which in the living bird would be directed forward and might help materially to speed it on its way. If impetus may be so derived it must be due to the leverage of the long, elastic flight quills. Firmly attached at their bases to the rigid, bony structure along the edge of the wing but free towards their tips to be uplifted by impact on the air, these feathers perhaps act somewhat as a crowbar is made to serve by the mason when, after inserting one of its ends under a heavy stone, he lifts at the other end and thereby forces the stone forward over the ground without raising it. Whether or not the suggestions just hazarded have any value — a friend has characterized them as no less absurd than the old time assumption that a man may lift himself by his boot straps — there is, I think, little or no doubt that the wind constantly fills the concave wings of the gliding Gulls much as it does the sails of close-hauled vessels and with similar results but with this essential difference; that whereas its force is exerted for the most part laterally on the vessels' sails and opposed by the side thrust of their keels or centreboards in the water, it must have chiefly a lifting effect on the wings of the Gulls and be counteracted by the weight of their bodies bearing downward. Hence we may infer that in the case of these birds forward movement is the resultant of two component forces, that of wind and of the attraction of gravitation.

The theory last stated is not novel of course. It has recently been taken up and in certain ways effectively demonstrated and supported by G. F. Tydeman[1] who, writing in French and making extensive use of abstruse mathematical calculations accompanied by diagrams to illustrate them, deals particularly and most interestingly with the flight of sea birds. His observation of it has apparently been so much more extensive than mine that I hesitate to differ with him respecting any of his assumed facts or resultant

[1] Le Vol. Plané Des Oiseaux par G. F. Tydeman. Archives Néerlandaises des Sciences Exactes et Naturelles Publiées par La Société Hollandaise Des Sciences à Harlem. Series III B (Sciences naturelles), Tome I, 1e et 2e Livraisons. La Haye, 1911.

conclusions.[1] I cannot accept all of these, however, and I am especially unwilling to endorse his belief that birds gliding to windward depend for means of propulsion largely if not wholly on uplift afforded by powerful ascending currents of air such as must always rise above a vessel when heavy wind is striking against and deflected from, her sides. The possibility of this was thought of and at first more or less favorably considered by Dr. Allen and me as we watched the Gulls from the deck of the 'Arabic,' a month or more before Mr. Tydeman's article came to our notice. But I dismissed it altogether from my mind after repeatedly seeing birds hundreds of yards behind the steamer, or fifty or more yards to one side (always the windward one) of her, or even well in advance of her, gliding on set wings in precisely the same manner and quite as ceaselessly as those which hung about her flanks. It seems inconceivable that her presence or movement could have caused vertically rising currents of air to be regularly maintained at such distances from her as those just mentioned, or that they could have been thus constantly and generally maintained by other influences when the ocean all about her was swept by a wind blowing over thirty miles an hour. I even doubt if they extended much above her upper deck for there I was lashed incessantly in the face by what seemed to be horizontally-racing wind, while several of the Gulls were often sailing fifteen or twenty feet higher still, perhaps directly over me. On the other hand it must be admitted that I have never known any of these birds to glide far to windward except when accompanying a steamship, a fact which apparently lends some support to Mr. Tydeman's contention, although not necessarily having such significance since it may reasonably be interpreted in other ways.

Conducted of necessity through opposing and invisible air currents constantly varying in force and also somewhat in direction the gliding flight of the Gulls seems very wonderful, however it be explained. It would be impossible of execution were not the birds endowed with some intuitive sense which enables them to instantly

[1] So many of these are in close accord with mine that it may be well for me to state that the present article is based almost wholly on observations and impressions recorded in my journal or other notebooks before I knew anything about Mr. Tydeman. It is true that some of my views have been modified since his article was brought to my notice but this has been due not so much to its influence as to helpful criticisms and suggestions contributed by ornithological friends.

and accurately adjust and readjust the set of their wings and the equilibrium of their heavy bodies so as to meet in precisely the most effective way, without either loss or gain of headway, each successive gust and interval of comparative calm. With regard to individual proficiency and endurance in performing and maintaining such flight little if any differences were noticeable among the one hundred or more Herring Gulls who followed the 'Arabic' on the afternoon of August 2, 1911. Nor were two Lesser Black-backed Gulls (*Larus fuscus*) who accompanied them inferior to them in these respects. But two superb Great Black-backed Gulls (*Larus marinus*) who joined the throng at the height of the gale and kept along with us for half an hour or more just above the level of the upper deck flew, all the while, as most Gulls do on ordinary occasions, that is by alternate flapping and sailing, beating their wings vigorously every few seconds. Quite evidently the art of gliding far into the wind on set wings was beyond either their knowledge or their power, else surely they would have resorted to it, with scores of birds close about them practising it. Whenever, as not infrequently happened, the Herring Gulls descended to within ten or fifteen feet of the crests of the waves they, too, seemed unable to advance against the wind without frequent, vigorous wing strokes. At such low levels the gliding flight appeared, indeed, to be never even attempted by any one of them, a fact doubtless possessing no little significance if only one knew just how to interpret it.

Before sunset our escort of Gulls became much reduced and before dark all the birds had left us. Thus they did not follow us quite out of sight of the shores of Ireland where, no doubt, many of them had nests with eggs or young. No others of their kind rejoined us the following morning nor were any again seen until we neared the coast of Massachusetts.

My readers will understand, of course that what I have had to say in the way of attempted explanation of the movement of gliding Gulls represents little more than personal inference and opinion based on field observations made under favorable conditions but extending over only two half days. Hence it should be taken as suggestive rather than assertive. The problem to which it relates is too difficult to be dealt with thus superficially and at the same time effectively. Before attempting seriously to solve the

mystery one should study the metaphysics of the general subject of flight and familiarize himself with its voluminous literature. For so onerous a task I have had insufficient time and possibly not much real inclination. Being thus handicapped I should perhaps have abstained altogether from theorizing. But the temptation was irresistible and if, by yielding to it, I have originated nothing of value there will at least have been little if any harm done — save, perchance, to my scientific reputation.

TWENTY-NINTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE Twenty-ninth Stated Meeting of the American Ornithologists' Union convened in Philadelphia, Pa., Monday evening, November 13, 1911. The business meeting was held in the Council Room, and the public sessions, commencing Tuesday, November 14, and lasting three days, were held in the lecture hall of the Academy of Natural Sciences.

BUSINESS SESSION.— The meeting was called to order by the President, Mr. Edward W. Nelson. Eighteen Fellows were present. The Secretary's report gave the membership of the Union at the opening of the present Stated Meeting as 887, constituted as follows: Fellows, 48; Honorary Fellows, 11; Corresponding Fellows, 60; Members, 78; Associates, 690.

During the year the Union lost sixty-six members, eight by death, twenty-four by resignation, and thirty-four for nonpayment of dues. The deceased members include one Fellow, one Honorary Fellow, two Corresponding Fellows, two Members, and two Associates, as follows:

Henry Augustus Purdie,[1] a Fellow, and one of the Founders of the Union, who died in Boston, March 29, 1911, in his 71st year.

Dr. Adolf Bernhard Meyer,[2] an Honorary Fellow, who died in Berlin, Germany, February 5, 1911, at the age of 71 years;

[1] For an obituary notice, see Auk, XXVIII, p. 387; also Memorial Address in the present number.

[2] For an obituary notice, see Auk, XXVIII, p. 519.

Capt. George E. Shelley,[1] a Corresponding Fellow, who died November 29, 1910, in London, England, at the age of 70 years; Dr. Gustav Edler von Hayek,[2] a Corresponding Fellow, who died in Vienna, January 9, 1911, in the 76th year of his age; Dr. Charles Otis Whitman,[3] a Member, who died in Chicago, Ill., December 6, 1910, at the age of 68; Manly Hardy,[4] a Member, who died in Brewer, Maine, December 9, 1910, in his 79th year; and the following Associates: Francis Wm. Rawle, of Bryn Mawr, Pa., who died June 12, 1911, and William Roth Wister, of Philadelphia, Pa.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition.

Frank M. Chapman was elected President; A. K. Fisher and Henry W. Henshaw, Vice-Presidents; John H. Sage, Secretary; Jonathan Dwight, Jr., Treasurer; Ruthven Deane, William Dutcher, F. A. Lucas, Chas. W. Richmond, Thos. S. Roberts, Witmer Stone, and Wilfred H. Osgood, members of the Council.

Drs. Alphonse Dubois, Brussels, Belgium; C. E. Hellmayr, Munich, Germany; Hermann von Ihering, São Paulo, Brazil; Herman Schalow, Berlin, Germany, and W. P. Pycraft, London, England, were elected Honorary Fellows; Gregory M. Mathews, London, England; Dudley Le Souëf, Melbourne, Australia; John Lewis Bonhote, Hempstead, England, and John G. Millais, Horsham, England, were elected Corresponding Fellows, and the following eighty persons were elected Associates, namely:

Adams, Benjamin, New York City.
Aldrich, Frank W., Bloomington, Ill.
Alexander, Miss Annie M., Piedmont, Calif.
Anthony, Harold E., New York City.
Babcock, Dean, Estes Park, Colo.
Baker, John Hopkinson, Cambridge, Mass.
Ball, Dr. J. P., Frankford, Pa.
Banks, Miss Martha Burr, Westport, Conn.
Batten, George, Montclair, N. J.
Bignell, Mrs. Effie, New Brunswick, N. J.

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[1] For an obituary notice, see Auk, XXVIII, pp. 387–388.
[2] For an obituary notice, see Auk, XXVIII, p. 388.
[3] For an obituary notice, see Auk, XXVIII, p. 149.
[4] For an obituary notice, see Auk, XXVIII, pp. 149–150.

Booth, Sherman M., Glencoe, Ill.
Borland, Wm. G., New York City.
Brown, Philip Greely, Portland, Me.
Browning, Wm. Hull, New York City.
Bubier, Geo. M., Lynn, Mass.
Burr, Freeman Foster, East Haven, Conn.
Chapman, Roy, Minneapolis, Minn.
Cheesman, Morton R., Salt Lake City, Utah.
Clay, Charles Irvin, Eureka, Calif.
Craig, Leon T., Mars Hill, Me.
Cushman, Mrs. John M., Jamestown, N. Y.
Dickey, Donald R., Dubuque, Iowa.
Duryee, Miss Anna B., Newark, N. J.
Dwight, Dr. E. W., Boston, Mass.
Dyer, Edward Tiffany, Southampton, N. Y.
Ekblaw, Walter Elmer, Urbana, Ill.
Francis, Geo. A., Bridgeport, Conn.
Fūgūet, Dallett, Upper Montclair, N. J.
Gianini, Chas. Alfred, Poland, Herkimer Co., N. Y.
Gordon, Harry Edgar, Rochester, N. Y.
Greene, Miss Mary Amory, Croton-on-Hudson, N. Y.
Gutsell, James S., Ithaca, N. Y.
Hallett, Geo. Hervey, Jr., Lansdowne, Pa.
Harris, Harry, Kansas City, Mo.
Hartman, Corpl. P. J., Honolulu, Hawaii.
Hersey, F. Seymour, Taunton, Mass.
Holt, Ernest Golsan, Barachias, Ala.
Hudson, Mrs. Katharine West, Cambridge, Mass.
Johnston, J. W., Rochester, N. Y.
Kendall, H. F., M. S., Virginia, Minn.
Kilburn, Frank M., Ithaca, N. Y.
Lambert, Dr. A. E., Middlebury, Vt.
Linton, Miss Ida L., Roxbury, Mass.
Mills, Dr. Herbert R., Jacksonville, Fla.
Mitchell, Catharine Adams, Riverside, Ill.
Moore, Henry D., Haddonfield, N. J.
More, R. L., Vernon, Texas.
Morley, S. G., Boulder, Colo.
Morris, Sidney V., Bristol, Pa.
Paladin, Arthur, Albany, N. Y.
Parsons, Robert L., So. Orange, N. J.
Pepper, William, M. D., Philadelphia, Pa.
Pierrepont, John J., Brooklyn, N. Y.
Post, William Stone, Bernardsville, N. J.
Rathborne, Richard Charles, Newark, N. J.
Robbins, Royal Elisha, Brookline, Mass.

Robertson, Howard, Los Angeles, Calif.
Roper, Kenyon, Steubenville, Ohio.
St. John, Prof. Edward Porter, Hartford, Conn.
Sanborn, Colin Campbell, Highland Park, Ill.
Schroeder, Arthur, Montclair, N. J.
Sheldon, Charles, New York City.
Shelton, Alfred, Petaluma, Calif.
Small, Harold Wesley, Bethel, Me.
Smith, Austin Paul, Brownsville, Texas.
Spelman, Henry M., Cambridge, Mass.
Stockbridge, Chas. A., Fort Wayne, Ind.
Stone, William Dudley, Fayetteville, Ark.
Strode, William S., M. D., Lewistown, Ill.
Taylor, B. F., Columbia, S. C.
Taylor, Walter Penn, Berkeley, Calif.
Tylor, J. E., Washington, D. C.
Victor, Edward W., Brooklyn, N. Y.
Weed, Benjamin, San Francisco, Calif.
Welles, Charles S., Elwyn, Pa.
White, Wilson Carlisle, Chester, S. C.
Whitney, Byam, Cambridge, Mass.
Williston, Mrs. Samuel, Belmont, Mass.
Young, Miss Harriet Tible, Hinsdale, Ill.
Young, John Paul, Youngstown, Ohio.

Drs. Allen, Dwight, Merriam and Richmond and Messrs. Brewster, Ridgway and Stone were re-appointed 'Committee on Classification and Nomenclature of North American Birds.'

Dr. A. K. Fisher, E. W. Nelson and Dr. Chas. W. Richmond were appointed 'Committee on Bird Protection.'

PUBLIC SESSIONS. *First Day.*— The meeting was called to order by the President, Mr. Chapman. An address of welcome was made by Dr. S. G. Dixon, on behalf of the Academy of Natural Sciences.

The papers read during the morning session were as follows:

'In Memoriam — Henry A. Purdie,' by William Brewster.

'The Validity of the Red-legged subspecies of Black Duck,' by Dr. Chas. W. Townsend.

'Description of a New Ptarmigan from the Aleutian Islands,' by Arthur C. Bent.

'The Status of the Blue-eared Jay (*Aphelocoma cyanotis*) in Texas,' by Harry C. Oberholser.

'The Relation of Genera to Faunal Areas,' by Dr. Spencer Trotter.

'New Light on the Name of the Traill Flycatcher,' by Harry C. Oberholser.

'Field Notes on "recognition marks" in certain species of Birds,' by John Treadwell Nichols. Remarks followed by Dr. C. W. Townsend, Messrs. Osgood, Fuertes, McAtee, and the author.

'Birds in the Markets of Southern Europe,' by Dr. Louis B. Bishop. Remarks followed by Messrs. Osgood, McAtee, Wm. Palmer, and Gronberger, Drs. Trotter and Townsend, Rev. Wm. R. Lord, and the author.

The first paper of the afternoon was:

'A Scheme to increase Insectivorous Birds,' by Rev. Wm. R. Lord.

The remaining papers, all illustrated by lantern slides, were:

'Recent Field Studies of some Ecuador Hummingbirds,' by S. N. Rhoads.

'An Automatic English Sparrow Trap,' by Chas. W. Miller.

'Exhibition of Lantern Slides and Moving Pictures of Birds,' by Clinton G. Abbott.

In the evening an informal reception was given the members of the Union by Mr. and Mrs. Wm. L. Baily at their home in Ardmore, Pa.

Second Day.—The meeting was called to order by the President.

The papers of the morning session were:

'Some Notes on the Egg-laying Habits of the Cowbird (*Molothrus ater*),' by Chas. W. Miller. Remarks followed by Messrs. Bowdish, Bent and Bailey, Rev. H. K. Job, and the author.

'Some Nesting Habits of the Least Sandpiper,' by Robert Thomas Moore. Illustrated by lantern slides.

'Report of the "American Bird Banding Association," by W. W. Grant.

'Autochromes of Land Birds and Sea Birds,' by Dr. Frank Overton and Francis Harper. Illustrated by lantern slides.

'Results of a Brief Visit to the Aleutian Islands and Bering Sea,' by Arthur C. Bent. Illustrated by lantern slides.

The following papers were presented at the afternoon session:

'Bird Notes from Pisgah Forest, N. C.,' by Harry C. Oberholser.

Illustrated by lantern slides. Remarks followed by Messrs. Brewster, Rhoads, and Forbush.

'Certain Asiatic Birds,' by C. William Beebe. Illustrated by lantern slides.

'Notes on the Flight of Gulls,' by William Brewster.

'An Ornithological Reconnaissance in Colombia,' by Frank M. Chapman. Illustrated by lantern slides.

'Call Notes of Tropical American Birds,' audibly illustrated, by Louis Agassiz Fuertes.

In the evening the visiting members of the Union were invited to a Smoker at the Academy, tendered by members of the Ornithological Section.

Third Day.— The meeting was called to order by the President.

The papers of the morning were:

'Flight Maneuvers of the Gannet and Kittiwake,' by Robert Thomas Moore. Illustrated by lantern slides.

'A Trip to the Magdalens,' by Wm. L. Baily. Illustrated by lantern slides.

'Bird Life on the Paramo of Mount Pichincha, Ecuador,' by S. N. Rhoads.

'The Propagation of Bob-white,' by Herbert K. Job. Illustrated by lantern slides. Remarks followed by Messrs. Fuertes, Pearson, Baily, Palmer, Rhoads, and Bowdish, Drs. Field and Fisher, and the author.

'The Classification of Kingfishers, with Particular Reference to the Genus *Ceryle*,' by W. De Witt Miller.

The papers of the afternoon (the closing) session, all illustrated by lantern slides, were:

'Bird Photography from Staten Island; in New York City; Gardiner's Island, N. Y., and Certain Virginia Coast Islands,' by Howard H. Cleaves.

'Bird Life in the Arizona Desert,' by Wm. L. Finley.

'Notes on the Birds of the Panama Canal Zone,' by Edward A. Goldman.

'Some Birds of the Orinoco Delta, Venezuela,' by Stewardson Borwn.

'The Hooting of the Blue Grouse,' by Vernon Bailey.

The following papers were read by title:

'The Gulls of Four Brothers Island,' by B. S. Bowdish.

'A Last Word on the Passenger Pigeon,' by Prof. C. F. Hodge.

'Possible Cause of the Extinction of the Labrador Duck,' by E. H. Forbush.

'Do Birds change their Routes of Migration?', by E. H. Forbush.

'Notes on the Laysan Finch,' by Prof. Hubert Lyman Clark.

'Last Days of the Wild Pigeon in Sullivan County, Pa.,' by Herman Behr.

'The Golden Plover (*Charadrius dominicus dominicus*) on the Coast of South Carolina,' by Arthur T. Wayne.

'Vagaries in Nesting of the House Wren,' by Wilbur F. Smith.

Resolutions were adopted thanking the Academy of Natural Sciences for the use of a hall for a place of meeting for the Union, and for other courtesies extended; to the Local Committee and other Philadelphia ornithologists for the cordial welcome and most generous hospitality shown visiting members and friends of the Union; to Mr. and Mrs. Wm. L. Baily for their kindness in entertaining the members of the Union at their home in Ardmore, Pa., and to the Zoölogical Society of Philadelphia for its kind invitation to visit the Gardens of the Society.

The following resolutions were unanimously adopted by the Council, November 13, 1911.

RESOLVED: That in regretfully accepting the resignation of Dr. J. A. Allen as Editor of 'The Auk,' on account of impaired health, the Council of the American Ornithologists' Union desires to express its high appreciation of the long and faithful service rendered by him. Taken in connection with his prior editorship of the 'Bulletin of the Nuttall Ornithological Club,' the predecessor and virtually the first series of 'The Auk,' Dr. Allen has served for a period of thirty-six years, a term of continuous editorial service rarely equalled in ornithological annals. It is not too much to say that the high position 'The Auk' has attained among the leading ornithological journals of the world is very largely due to the wise, able, and conscientious manner in which his editorial duties have been performed.

RESOLVED: That the Council of the American Ornithologists' Union desires to place on record its great regret that illness should prevent the attendance at this meeting of Mr. William Dutcher, long a member of the Council. He is very much missed and

tenderly remembered, and the hope is expressed that his health will soon be restored.

Mr. Witmer Stone was elected to succeed Dr. Allen as Editor of 'The Auk.'

The next meeting of the Union will be held in Cambridge, Mass., the date to be determined later.

JNO. H. SAGE,
Secretary.

GENERAL NOTES.

The Laughing Gull at Marshfield, Massachusetts.— On May 30, 1911, while making a trip along the "South Shore," I observed at Marshfield a single Laughing Gull (*Larus atricilla*) sitting on the water a little distance out. The black head and the solid black outer primaries showed up very conspicuously, making identification sure. Also it was noticeably smaller than the Herring Gulls which were near it. This is, I believe, a new record, not only for Marshfield, but also for Plymouth County, of the Laughing Gull, as I have not been able to find any previous date.

Again, on July 29, 1911, while Mr. J. Archibald Hagar, Mr. H. D. Mitchell, and I were sitting on the cliff at the mouth of the North River, we saw four black-headed gulls fly up into the mouth of the river. We watched them for some time and identified them plainly as Laughing Gulls.

The next day (the 30th), we three, accompanied by Mr. J. C. Hagar, in a boat on the South River, near the mouth, saw a pair of these same gulls on the flats, so near that we could see the white eye-ring and the reddish bill. They were very handsome birds and seemed to be much smaller than the Herring Gulls which were around them.

It is to be hoped, and these records may possibly indicate that the Laughing Gull is extending its range a little farther northward in Massachusetts.— HAROLD L. BARRETT, *Jamaica Plain, Mass.*

Franklin's Gull (*Larus franklini*) **at Philadelphia.**— Mr. Philip Laurent recently submitted to me for identification a gull recently presented to him by Mr. Charles Liebeck who had shot it October 22, 1911, on the Philadelphia "neck," the open swampy ground lying below the built up portion of the city, above the juncture of the Delaware and Schuylkill rivers. The bird was in immature (juvenal) plumage, largely ashy gray, with a gray tail and black terminal band, almost a counterpart of the Laughing Gull (*L. atricilla*) in similar plumage except for the smaller

size and noticeably different bill. In these respects it exactly matched adult specimens of Franklin's Gull in the collection of the Academy of Natural Sciences of Philadelphia. Subsequently I compared it with young Franklin's Gulls in the collection of Dr. Jonathan Dwight, Jr., which showed at once that it belonged to that species. This is the first record of the bird for Pennsylvania and I believe the second for the Atlantic coast.— WITMER STONE, *Academy of Natural Sciences, Philadelphia, Pa.*

The Black-backed Gull (*Larus marinus*) **on Long Island, N. Y., in August.**— Near Jones Inlet, on August 14, 1910, I collected an adult female of this species. As this bird does not make its appearance on Long Island until the cold weather sets in, late in the fall, this early date appears to be a rare exception. The bird was moulting heavily, especially the primaries, so that it was unable to fly more than about 15 yards at a time. The fact that the specimen was moulting after having migrated instead of moulting before the migration period is quite unusual.— J. A. WEBER, *Palisades Park, N. J.*

Phætusa magnirostris Licht. in Cuba.— On May 28, 1909, I secured an immature specimen of *Phætusa magnirostris* Licht. in the Laguna del Centeno, Nipe Bay, Oriente Province, Cuba. This is the first record for the species in Cuba, there being no doubt as to its identity, for it has been compared by Messrs. Frank M. Chapman and W. DeW. Miller at the American Museum of Natural History. This tern was the only one seen in the lagoon at the time.— CHARLES T. RAMSDEN, *Guantanamo, Cuba.*

Ixobrychus exilis in Texas.— On March 24, 1911, I received a Least Bittern (coll. H. K. C. No. 15026 ad. ♂) in the flesh from Capt. S. W. F. Hase, U. S. A., Fort Crockett, Texas, with the interesting information: "This morning while on a hike I ran across a flock of birds. One of them, apparently a young one, froze himself to the ground, stretching his long bill upward, and I had difficulty in seeing him among the yellow flowers. I placed my sabre across his feet, and picking him up, stuck him through the head."— HENRY K. COALE, *Highland Park, Ill.*

Egret in Northern New Jersey.— On August 7, 1911, as I was motoring past a meadow at Coleville, N. J., which is a small village situated five miles from Sussex, N. J., I saw an Egret. The altitude of Coleville is 800 feet. Three and a half miles distant is the highest point in the State, the height of which is 1809 feet. Coleville is four and a half miles from the New York and New Jersey state line, and six miles from the Delaware River.— JOHN DRYDEN KUSER, *Bernardsville, N. J.*

Yellow Rail (*Coturnicops noveboracensis*).— I recently examined a specimen of this somewhat obscurely known rail that was secured April 22, 1911, in Ecorse Township, Wayne County, Michigan. Mr. Arthur

Borck and a companion were gunning through a piece of tangled weedy low ground when the rail flushed from almost under their feet, and, by a lucky shot, was secured. The bird was mounted when I saw it and the sex is not known. This is the second recorded Michigan specimen, and the third noted in Wayne County, as a female was secured alive by a dog, and another flushed March 25, 1908 (see Taverner, Auk, 1908, p. 327).

I do not, however, consider that the species is as rare as these few records would seem to demonstrate, but that its skulking habits and the almost total inability to flush it render observation very unlikely. Here on Grosse Isle, a few miles below Detroit, I am positive that it occurs. Since May, 1907, I have heard, during April–June, notes that are so similar to those described for this species, which, taken together with the kind of marsh occupied, render it highly probable that the notes belong to a Yellow Rail. The territory in question is a wet low field, grown up with a coarse tangled mass of grasses, weeds, and sedges, similar to the kind of ground usually occupied by Henslow's Sparrows. Repeated attempts to flush the birds have failed but the services of a good dog would probably be more effective. The notes are somewhat similar to the effect produced by taking a small bottle in one hand, and tapping it lightly and slowly with a stone twice, with a short interval, repeated half a dozen times.

This species has been found in June in the low marshy territory at the mouth of the Thames River, Lake St. Clair, Ont., by Mr. W. E. Saunders. On this ground, on June 10, 1905, we heard notes which Saunders declared to be those of a Yellow Rail. We made several attempts to flush the bird by dashing quickly at the spot from different directions, but failed.— B. H. Swales, *Grosse Isle, Mich.*

The Semipalmated Sandpiper in Philadelphia County, Pa.— On October 3, 1910, the writer examined three Semipalmated Sandpipers (*Ereunetes pusillus*) in the possession of a gunner, who shot the birds on the Delaware River meadows, at Bridesburg, Philadelphia County, Pa. One of these birds, a male, which is now in my collection, was generously given to me by the gunner, who, however, refused to part with the others, and what eventually became of them I do not know, but doubt if they were preserved.

This is the only authenic record of the occurrence of the Semipalmated Sandpiper in Philadelphia County, to my knowledge. There are, however, numerous unreliable records of birds *seen*, but this species so closely resemble the Least Sandpiper, with which it intimately associates, in coloration and habits, that it is practically impossible to distinguish between the two species in the field.— Richard F. Miller, *Harrowgate, Philadelphia, Pa.*

The Golden Plover (*Charadrius dominicus dominicus*) **on the Coast of South Carolina.**— I shot on November 4, 1911, near Mount Pleasant, a fine adult male specimen of this now rare species, which was searching

for food in a recently ploughed field. This makes the third specimen I have seen in South Carolina since 1880, and the second that I have taken.

Although the bird had been wounded in one wing, which had not entirely healed, it was in excellent condition, being very fat. This specimen, like the one I took in December, 1880, was very wild.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Capture of a Golden Eagle at Kansas City, Mo.— On the morning of Oct. 31, 1911, at Seventieth Street and Broadway, Kansas City, Mo., there was captured by Owen Belford of Oklahoma City, and John Bower of Kansas City, Mo., a young Golden Eagle, measuring seven feet eight inches from the tip of one wing to the tip of the other. The men fired at several crows and struck the eagle, which was only stunned, and fell to the ground making the catch easy. The bird was on exhibition at police headquarters.— BENJ. F. BOLT, *Kansas City, Mo.*

Duck Hawk (*Falco peregrinus anatum*).— Mr. Arthur Borch, a Detroit taxidermist, received a fine nearly adult male Duck Hawk that was secured on July 15, 1911, in rather a novel manner. A lady was driving near Lake St. Clair, Grosse Pointe, when suddenly the hawk darted across a field, dived straight at her horse, and became entangled in the fly netting upon which he was killed with a whip. The Duck Hawk was probably in pursuit of some small bird that took refuge near the horse and which the lady failed to see. Wayne County records for this bird are not common, and this is my first summer record. On March 9, 1908, I watched one beating up the Detroit River near Grosse Isle. Two specimens were secured October 21, 1909, between Celeron Island and the mouth of the Huron River which I examined at the taxidermist's shop. On Lake Erie, near Point Pelee, however, we regularly see the bird in spring and fall.— B. H. SWALES, *Grosse Isle, Mich.*

Another Saw-whet Owl from Oregon.— To-day I had the pleasure of examining the skin of an adult female Saw-whet Owl (*Cryptoglaux acadica acadica*) shot by George D. Baker, a Portland taxidermist. The specimen was taken Oct. 12 of this year (1911) only seven miles from the coast near Gairdner, Douglas Co., Oregon. This is the sixth specimen taken by Mr. Baker near this locality during the past ten years.— STANLEY G. JEWETT, *Portland, Oregon.*

Occurrence of the Yellow-headed Blackbird on the Delaware River near Philadelphia, Pa.— According to Mr. Edwin C. Axe, the well-known taxidermist of Frankford, Philadelphia, Pa., there are two mounted specimens of the Yellow-headed Blackbird taken on the Delaware River marshes above the Pensauken Creek, in Burlington County, New Jersey, in collections in this city. Mr. Axe mounted the birds, which were

shot many years ago, and knows what he is talking about. One specimen was in the possession of the late Mr. Redmond, whose collection of birds I have been unable to locate, and the other bird is supposed to be in the collection of mounted birds now in the possession of a Mr. Bates of Bridesburg, Philadelphia.

The rarity of this species on the Delaware River is at once apparent when it is known to be an extremely rare straggler east of the Alleghanies. The only record of its occurrence in this region is of a bird shot in August, 1851, by John Krider on the marshes below Philadelphia, which is now in the Academy of Natural Sciences of Philadelphia. (Stone, Birds of Eastern Pennsylvania and New Jersey, p. 105.)

As I am hunting up data on the status of the Yellow-headed Blackbird in this locality, I may be able to report more fully upon the authenticity of these two occurrences of this rare bird at another time, this note being written principally to attract the attention of ornithologists to the occurrence of the above two birds, so as to secure if possible further information on these doubtful (?) records.— RICHARD F. MILLER, *Harrowgate, Philadelphia, Pa.*

Xanthocephalus xanthocephalus in Eastern Cuba.—I beg to report that two specimens of the Yellow-headed Blackbird have been in the yard at San Carlos Estate, Guantanamo, Cuba, for two weeks, where they come daily with a band of *Ptiloxina atroviolacea* and *Agelaius assimilis*, to eat oats with the barn fowl. This is the first record for eastern Cuba according to Dr. Gundlach, who says in his work on Cuban Ornithology, that he knows only of one specimen, which was seen in the market at Havana, among birds that were shot for marketing.— CHARLES T. RAMSDEN, *Guantanamo, Cuba.*

Additional Records of the Evening Grosbeak in Pennsylvania.—I have recently purchased for my collection two mounted specimens of the Evening Grosbeak which were captured near La Anna, Pike Co., Pa., during the winter of 1889–90. The gentleman who had these specimens shot them from a flock of 15–20 and had them mounted. They remained in his possession until I saw them and, recognizing the rarity of the birds, secured them from him. They are a male and female in adult winter plumage and form desirable additions to the meagre list of captures recorded from this State.— RICHARD C. HARLOW, *State College, Pa.*

The Seaside Sparrow (*Passerherbulus maritimus maritimus*) **Breeding on the Coast of Georgia near Savannah.**—Mr. Gilbert R. Rossignol, Jr., of Savannah sent me four specimens of Seaside Sparrows for identification last summer and which were breeding on Cabbage Island, Warsaw Sound. I have compared these birds, which were taken in May, with specimens of *P. m. macgillivraii* from Charleston taken in autumn, winter, spring

(April), and late summer (July 25) birds, and they are all true *maritimus*, which is indeed an anomaly, as the form that breeds on the North Carolina coast east of Pamlico Sound is *P. m. macgillivraii* (see Bishop, Proc. Linn. Soc. N. Y., Dec. 19, 1904, pp. 57, 58).

Although these specimens, taken in Warsaw Sound, have been identified by a well-known ornithologist as *Ammospiza maritima macgillivraii*, they are without doubt representatives of *P. m. maritimus*.

A specimen of *macgillivraii* taken by me on July 25, 1900, ♀ ad., although in very ragged plumage, must have been an exceedingly dark bird when in fresh plumage for the pileum and back are very deeply colored, and the mesial streak on the middle tail feathers is yet very wide despite the skeletonized condition of the tail.

I question whether Macgillivray's Sparrow breeds in Georgia or in Florida, for the birds taken there in the breeding season were in worn plumage and the characters which differentiate *maritimus* from *macgillivraii* being obliterated the birds were assumed to be *macgillivraii* on account of its more southern distribution. In view of the unique breeding range of *P. m. macgillivraii* I should not be at all surprised if it is in reality a species, as its breeding range suggests *specific* difference. A female *macgillivraii* in my collection taken by me on February 11, 1891, near Charleston, is as black on the upper parts as *P. nigrescens*.— Arthur T. Wayne, *Mount Pleasant, S. C.*

The Bohemian Waxwing in Vermont in Summer.— It has been my good fortune to spend the time from August 7 to the 20th at Willoughby Lake this summer. Lake Willoughby, in the town of Westmore in northern Vermont, about 25 miles from the Canadian border, is a well known region to the botanists and ornithologists of New England. On the sandy beach at the south end of the lake, between Mt. Pisgah and Mt. Hor there are many birches; some are bare, dead trees, while other are well covered with leaves.

While at the beach August 18 a few Cedar Birds were about the trees, but on a dead tree, a Black-throated Green Warbler was looking over the branches, when what I first thought was a Cedar Bird flew to the same tree, and remained there a long time. As I looked at it, it seemed larger than a Cedar Bird; then I saw some white wing bars plainly. I watched it for twenty minutes or more, and when I left the beach it was still there.

Since then I have had a dead Cedar Bird in my hand to examine, and this bird at Willoughby was certainly larger, and the white wing bars (3 I think) were plainly to be seen. There was plenty of time to look at the bird, for it remained just where it perched at first as long as I watched it, and there were no leaves or branches to hide it.

I reported this incident to Dr. Walter Faxon of Cambridge, who is familiar with this region. I take the liberty to quote his reply: "I do not doubt that the bird you saw was the Bohemian Waxwing. The size and particularly the white wing-bars would distinguish it from the Cedar Bird." — Anna E. Cobb, *Providence, R. I.*

Another Record of the Philadelphia Vireo from Long Island, N. Y. —On the morning of September 4, 1911, at Freeport, Long Island, I was "beating out" a tract of bushes on a salt marsh, in hope of seeing again a Migrant Shrike which I had flushed there the night before. The small growth fairly teemed with birds, but much to my disappointment the shrike was not to be found. When about to leave I noticed, feeding in the top of one of the taller bushes in company with some Red-eyes, a pair of small Vireos that I did not recognize. I collected one of the little fellows and great was my joy when unpacking the skin to find it to be a fine female specimen of the Philadelphia Vireo (*Vireosylva philadelphica*).

This bird, which is probably the fifth record from Long Island, and first since 1901, is in the collection of the Museum of the Brooklyn Institute.—Henry Thurston, *Brooklyn, N. Y.*

Bachman's Warbler in Camden Co. and Breeding in Chatham Co., Georgia.— Under the above title Mr. Isaac F. Arnow records in 'The Auk,' Vol. XXV, October, 1908, p. 479, Bachman's Warbler (*Vermivora bachmani*) breeding at Savannah. These eggs, three in number, were found by Mr. Gilbert R. Rossignol, Jr., who, however, was extremely doubtful as to their identity, as he saw no bird.

Mr. Rossignol sent me the eggs for positive determination and, upon their reception, one glance was sufficient to disprove Mr. Arnow's identification, for they are unmistakably and unquestionably eggs of Swainson's Warbler (*Helinaia swainsoni*). I, however, compared them critically with two sets of *Vermivora bachmani* representing extremes — largest and smallest — that were in my collection, and which I took near Charleston, and the difference was appreciable at a glance. Mr. Arnow says that the eggs of Swainson's Warbler are without gloss. The fact is the eggs are often *very* glossy. Mr. Rossignol had nothing whatever to do with the identification of the supposed eggs of Bachman's Warbler, as he was merely the owner, and I may add that my identification is free from bias.—Arthur T. Wayne, *Mount Pleasant, S. C.*

Dendroica æstiva Captured by a Spider.— In the early part of September my friend, Otto Helwig, while crossing a piece of brush land on the edge of town, flushed a Yellow Warbler, which flew against a big spider-web stretched across a bush, and became entangled with wings spread out against the web. As the bird struggled to free itself, the spider (a large black one with yellow markings) ran down the web and at once began to bind its victim, by running back and forth across its body and wings and weaving its silken strands from side to side, completely tying the bird to the web. At this point Mr. Helwig stepped up, the spider dropped into the bush, the bird was released, soon revived and flew off.—Henry K. Coale, *Highland Park, Ill.*

The Louisiana Water-Thrush and Broad-winged Hawk in Southern New Jersey.— In Mr. Stone's recent work on New Jersey birds the

general impression is given that the Broad-winged Hawk is a very rare summer resident of southern New Jersey, while it is said that the Louisiana Water-Thrush is entirely absent, or at least no records of it have been secured. It is with the idea of giving additional information on this subject that I record the following.

I have several records of the Broad-winged Hawk in summer from Clementon, Dennisville, and Bennetts, and on May 27, 1908, saw a pair at Ludlam Lake near Dennisville which had a nest nearby, judging from their actions.

The Louisiana Water-Thrush is undoubtedly a rare summer resident but nevertheless in three successive trips near Bennetts, Cape County, I have found one or two pairs each time during the breeding season, and David Harrower has also observed them in this vicinity. This information is given solely with the object of increasing the records extant of the birds in this locality.— RICHARD C. HARLOW, *State College, Pa.*

Western Records of the Catbird (*Dumetella carolinensis*).— A recent note in 'The Auk' on a Catbird taken at Nampa, Idaho, reminded me of a specimen in my collection taken at Sparta, Oregon, August 11, 1906, where several were seen at the time. This is the farthest west I have ever seen the species but I have found them common all over the Snake River valley from Nampa, Idaho, east to Pocatello, Idaho, and north of Boisé in the foothills where they breed in considerable numbers.— STANLEY G. JEWETT, *Portland, Oregon.*

An unusually late Nesting Date of the Catbird (*Dumetella carolinensis*).— On August 20, 1911, I flushed a Catbird from her nest near Fort Lee, N. J. The nest contained two newly hatched young and one egg. Believing this to be an unusually late nesting date I thought it worthy of record.— J. A. WEBER, *Palisades Park, N. J.*

Capture of the Carolina Wren at Portland, Maine.— It is my wish to place on record the taking of a Carolina Wren (*Thryothorus ludovicianus ludovicianus*) on November 3, 1911, since it is, I believe, but the second of its kind ever seen in this vicinity. The bird flew into my sunroom where I secured it by casting a light cloth over it, and placed it in a canary cage swathed about with mosquito netting to prevent its fighting the bars. The bird was active, seemed in good condition, and, with the coming of night, slept serenely; but it died unexpectedly in the morning when I was out of the room. It had taken a little mockingbird food and a little soaked cracker, but showed no liking for either. Mr. Arthur H. Norton, who prepared the bird's skin for the Natural History Museum, states that it was an old female and died apparently from natural causes.

I find that my neighbor had watched this bird in her garden the day before its fatal visit to my house. Bowdoin Street is on the southwestern

edge of Portland where grassy fields, wet thicket, the steep wooded slope of the Western Promenade, old gardens, and a sunny old burying ground make admirably diversified territory for birds, bringing us into the midst of spring and fall migrations.

The other Carolina Wren, a male, was discovered some time in August, 1908, at Falmouth, Maine, by Mrs. Ernest Brewer, who observed it throughout the remainder of the summer, until October 3 when Mr. Norton shot it for the Portland Society of Natural History, at whose museum the skins of both these wrens are now kept.

Records of Mrs. Brewer's Carolina Wren are to be found in 'The Auk,' XXVI, p. 82; and in an article by her in the Journal of the Maine Ornithological Society, XI, pp. 4–10.— CAROLINE M. STEVENS, *Portland, Me.*

Carolina Wren (*Thryothorus ludovicianus ludovicianus*).— On January 16, 1911, I heard the familar notes of a Carolina Wren coming from the rear of my home on Grosse Isle, and I soon detected him perched on my vine-clad ice house, scolding and singing pretty constantly. It was a sharp clear day (11° F.), and the bird was still present when I left for Detroit at 3 P. M. This was the first Carolina Wren that I had seen or heard of on Grosse Isle. During the summer a Mrs. Donaldson told me that a pair had bred on Hickory Island immediately connecting Grosse Isle on the south, but this I have not been able to verify to date. On September 3, 1911, I noticed a Wren singing gayly from the top of a shed near my place, and this bird remained around for several days, generally frequenting an old chicken shed. I am entertaining hopes that a pair may return here next spring. P. A. Taverner secured a female May 16, 1909, near Rockwood, a few miles further down the river. These instances seem to indicate, together with the Detroit records, that the Carolina Wren is gradually working up into southeastern Michigan as it has in Essex County, Ontario. Here on June 6, 1909, about three miles below Amherstburg, W. E. Saunders heard one singing, and another about three miles from the base of Point Pelee where it is common, and resident. On October 6, 1909, Mr. Jas. S. Wallace saw one on the roof of the Manning House, Windsor, directly across the river from Detroit. North of Detroit there is a mounted specimen in Mr. Samuel Spicer's collection taken at Goodrich, Genesee County, a number of years ago in spring.— B. H. SWALES, *Grosse Isle, Mich.*

Waterfowl Nearly Drowned.— In the Aviary building of the Chicago Lincoln Park Zoo is a cage about 40 × 15 feet enclosing an island, surrounded by water — which is the home of over 200 wild Ducks, Geese, Swans, Pelicans and other birds from different countries, representing 60 different species. Mr. Ryan, the assistant keeper, told me of a singular mishap, through which the water birds nearly lost their lives by drowning. The pond is 30 inches deep, and once a month the water is run out,

and fresh water supplied from Lake Michigan, on which occasion all the waterfowl have great sport in the clean, fresh water. Last February the new system of supply was forced by suction through a screen, by a very powerful steam pump. After the pond was filled it was noticed that the water was thick and oily and instead of "running off the duck's back" as usual, soaked right into his feathers. In a few minutes the birds became literally water-logged, and were floundering around, unable to keep on top of the water, and too weak to crawl up on the island. Boards were floated on the surface, on to which some of the birds climbed, while the water was being run off, which took about an hour. It was found that the bottom of the pond was covered to a depth of several inches with a thick pulp of pulverized fish, which had been ground up by being sucked through the fine screen. Several wagon loads were removed, and it took a long time to clean the pond and the birds which were soaked with the oily moisture.— HENRY K. COALE, *Highland Park, Ill.*

Shore-bird Notes.— Last September, Wilson's Phalarope appears to have been not uncommon along the Atlantic Coast. I have never seen this species before, although I shot a Northern Phalarope at Quogue, L. I., during the month of August, 1907. I have the following records of the occurrence of Wilson's Phalarope. Adult female shot by Mr. Whitlock at Quogue on September 4. Immature in winter plumage were shot near Currituck Light House, North Carolina, by Mr. Whitlock and Mr. Nourse on September 7, September 8 (two), and September 12. A well-marked female was seen by me September 14. This bird was so tame that it allowed me almost to touch it before it flew away in a zigzag manner. An old gunner at Currituck had never seen these birds before.

The Buff-breasted Sandpiper seems also to have been unusually common along the coast. Mr. Whitlock shot a specimen at Quogue, L. I., on September 4, and three at Currituck on September 12. I saw a flock of six at the same place on September 14. This species was also unknown to the local gunners.

On September 11, at Currituck, I shot a Solitary Sandpiper on a sandy beach. I have frequently seen this bird in woodland streams but never near salt water.

On September 12, two Marbled Godwits were shot by Mr. Whitlock and myself at Currituck. The female was the smaller, measuring 17.00 and the male 19.25. The absence of bars on the underparts would indicate that they were young birds.

I trust these records may be of interest, both as individual records and also as showing the tendency of certain western Shore-birds to follow the same line of migration to the shores of North Carolina as is later followed in far greater numbers by the Canvas-back, the Mallard, and the Whistling Swan.— FREDERICK WM. KOBBÉ, *New York City.*

Two Interesting Captures in Lincoln Park, Chicago.— On June 12, 1911, Officer C. W. Borggren of Lincoln Park, Chicago, came into my office with a fine specimen of *Cyanocitta stelleri diademata* which he had just shot. The bird was in perfect plumage, with no fraying of the tail or primaries, characteristic of a bird that has been caged. He said that his attention had been called to the bird by the cries of a large number of birds nesting in the park, and he found that the jay had taken all of the young from the nest of a Yellow Warbler, had eaten the heads and dropped the bodies to the ground, and was about to repeat the operation on a nest of young Robins. He shot the bird, which is now in the Museum of the Chicago Academy of Sciences, Lincoln Park.

On September 19, Mr. P. W. Boehm, of Ravinia Park, Illinois, brought in a specimen of the Duck Hawk in the juvenile plumage. The bird had flown into his chicken yard, and had killed and was attempting to carry away a three and one-half pound chicken.

Mr. Kahman, a Chicago taxidermist, reported that on the 21st of September, an Italian had brought him two young female Duck Hawks which, he said, had flown into his yard on the west side of the city, and had killed several of his pigeons. They were so bold that he had no difficulty in killing both of the birds.— FRANK M. WOODRUFF, *Chicago Academy of Sciences, Chicago, Ill.*

Two New Birds for Greenland.— In examining literature relating to the ornithology of Greenland I have found the following recent references to two birds that to my knowledge have not as yet been recorded from that country. These are:

Turdus iliacus Linn. (Petersen, Johan, 'Ornith. Iaktt. fra Angmagsalik i Aarene 1902–08, bearbejdede og sammenstillede af O. Helms,' Dansk Ornith. Foren. Tidsskrift, 3 Aargang, Haefte 1, Copenhagen, Dec., 1908). In translation the reference reads as follows: "To-day [Oct. 20, 1904], 'Kateketen,' [probably some kind of a pedagogue], and myself each shot one specimen here at the station [Angmagsalik, east coast of Greenland]; they flew from one icefloe to another, near the shore, looking for food. Occasionally they made a little trip inshore, where they no doubt secured sandhoppers and small slugs; they were not very shy." And again, October 31, 1906: "I received to-day a 'Vindrossel' [Danish name for the Redwing] from a Greenlander, who had shot it on the shore." November 3, same year: "A Greenlander saw a strange bird in the course of the day, which he supposed to be a 'Vindrossel.'" Three birds were shot and their skins forwarded to the Museum at Copenhagen. Helms states that this is the first record of *Turdus iliacus* from the east coast of Greenland, while there have been "a couple of mentions from the west coast." These mentions are probably the following: (Winge, Herluf, 'Grønlands Fugle,' Medd. om Grønland, Heft 21, Copenhagen, 1899, p. 283): "The Redwing has been seen a couple of times on the west coast of Greenland.

Paulsen received one in 1845 from Greenland. One was shot at Frederikshaab on the 28th (not the 20th) of October, 1845, and sent to Copenhagen Museum by Holbœll." As is well known, the Redwing is a Eurasian species, common and breeding throughout Iceland, northern Scandinavia, Finland, northern Russia and Siberia as far east as Lake Baikal. It is a common winter visitor in the British Islands, and has also been found on Jan Mayen Land.

Totanus totanus (L.), or *Scolopax calidris* of Linnæus (Helms, O., 'Nye arter for Ostgrønland,' Dansk Ornith. Foren. Tidsskrift, 4. Aargang, Haefte IV, Copenhagen, October, 1910). This is what Helms has to say on the subject (p. 131): "Petersen received a specimen of the 'Rødben' (*Totanus calidris*) from a boy who had shot it at Kililtorajivit on Angmagsalik Fjord. This is practically the first occurrence of the Redshank recorded for Greenland; the bird probably came from Iceland, where it breeds in great abundance."— The Redshank also is of Eurasian origin, its range extending from Iceland to China.— S. M. GRONBERGER, *Smithsonian Institution, Washington, D. C.*

Additions to a List of the Birds of Harding County, Northwestern South Dakota.— In 'The Auk' for January, 1911, pages 5–16, I gave a partial list of the birds of this county. It can be somewhat supplemented now. Mr. A. A. Saunders, of the Forest Reserve, spent portions of November and December, 1909, in this region and observed six species not mentioned in the list. Mr. Saunders has kindly permitted me to announce these records. I spent from June 6 to 20, 1911, in this county under the auspices of the State Survey and revisited the greater part of the county. Due to the unusual severity of the drough, birding was poor and only four species were added to the published list. The ten new species are marked with an asterisk.

Mergus americanus. AMERICAN MERGANSER.— Taken August 10, 1910, in Harding Valley by a resident.

Astur atricapillus atricapillus. GOSHAWK.— One seen by Mr. Saunders near Harding, November 7.

Asio flammeus. SHORT-EARED OWL.— Found nesting in 1911 east of the Slim Buttes.

***Nyctea nyctea**. SNOWY OWL.— Several seen north of Camp Crook, December 14 by Mr. Saunders.

Cyanocephalus cyanocephalus. PIÑON JAY.— While in 1910 we found these birds only in the Cave Hills, they were found in all of the forested buttes in 1911. The old timers say that they are new arrivals.

Molothrus ater ater. COWBIRD.— While in 1910 I saw not more than a score of individuals, in 1911 they were frequently observed and were quite numerous.

***Quiscalus quiscula æneus**. BRONZED GRACKLE.— Several nested near Reva in the Slim Buttes in 1911.

***Acanthis linaria* (*linaria*?).** REDPOLL.— Mr. Saunders reports having seen a small flock of Redpolls in West Short Pine Hills on November 6.

***Plectrophenax nivalis nivalis*.** SNOW BUNTING.— Flocks were seen by Mr. Saunders during the last half of November and the first half of December, the time that he spent in this region.

***Calcarius lapponicus lapponicus*.** LAPLAND LONGSPUR.— Reported by Saunders to have been abundant during his stays.

***Spizella monticola ochracea*.** WESTERN TREE SPARROW.— Common in the Short Pine Hills in December (Saunders).

***Passerina cyanea*.** INDIGO BUNTING.— One seen in Slim Buttes, June 12, 1911.

Piranga ludoviciana. WESTERN TANAGER.— One of the most conspicuous of the birds in the Short and Long Pine Hills at the middle of June. Two nests found.

Bombycilla garrula. BOHEMIAN WAXWING.— Reported by several to have been in 1910–1911 one of the most numerous of the winter birds of the pines.

Seiurus aurocapillus. OVENBIRD.— Nested abundantly in the Short Pines in 1911.

***Setophaga ruticilla*.** REDSTART.— Several pairs nested in the Slim Buttes in 1911.

***Sitta carolinensis aculeata*.** SLENDER-BILLED NUTHATCH.— Seen November 8 in the East Short Pine Hills by Mr. Saunders.

***Planesticus migratorius propinquus*.** WESTERN ROBIN.— More abundant in 1911 in the pines than was the Eastern Robin.— STEPHEN SARGENT VISHER, *Vermillion, S. D.*

Notes from West Virginia. *Empidonax trailli alnorum*.— From August 5 to 11, 1909, I spent several days with a collecting party in the Cranberry Glades, Pocahontas County, West Virginia. Many northern species of plants, mammals, and birds were found there. Among these were Alder Flycatchers in considerable numbers. Three specimens were taken, all of which were young birds. One of these young birds was fed by an adult just a moment before it was shot. Very frequently during my stay in this region one or two adults accompanied by three or four young were seen. They were most common in the alder thickets about the edges of the glades.

***Peucæa æstivalis bachmani*.** — My first record of the occurrence of Bachman's Sparrow in West Virginia was made in Wood County in late summer, 1903. Since then it has become quite common in the central and northern parts of the State. Many were observed at Waverly, Wood County, from 1903 to 1907. In certain old fields, near the edge of the woods, the males might be heard in song almost any day from April 25, when they first appeared, till midsummer, when the song period seemed to cease. More recent records have been made as follows:—

Morgantown, observed in spring and summer, 1909–1911.

Weston, quite common for past four years.

French Creek, quite common in spring and summer during the past five years. At least four pairs seem to have nested on a little farm of about one hundred acres during the summer of 1910. The sweet song of this bird might be heard coming from many directions on any morning in spring or early summer. On May 1, 1911, a male was taken at French Creek. It was singing when shot, and had been singing near the same place for about two hours. This specimen was identified by W. E. Clyde Todd of the Carnegie Museum, Pittsburgh, and the skin is now in my possession.

Melospiza georgiana.— Quite common in the Cranberry Glades, Pocahontas County, in August, 1909. Old birds were observed with young just from the nest.— EARLE A. BROOKS, *Weston, W. Va.*

New Records from Arkansas.— During December of 1910 Mr. Logan Evans of Wilsey, Kansas, spent a few days in Mena, Arkansas, and while there collected and made up a small series of bird skins. The species represented are mainly those commonly found in that region in winter but I note one specimen of *Spinus p. pinus*, a female taken December 21, 1910, which is apparently the first record of this bird for the State, though it is undoubtedly a more or less irregular winter visitant. (*cf.* Howell, Birds of Arkansas, Bull. Biological Survey, No. 38, p. 61.) Other records of interest are a pair of *Dryobates borealis*, the female taken December 23 and the male December 26, 1910. These are to my knowledge the first noted from this locality.— ALEX WETMORE, *Biological Survey, Washington, D. C.*

Notes from the Magdalen Islands.— **Spatula clypeata**. SHOVELLER. — One shot at Grindstone Island by a native during the first week of September, 1906. It was examined by Mr. Stanley Cobb and myself but decomposition was too advanced to save the skin.

Limosa hæmastica. HUDSONIAN GODWIT. — On September 11, 1908, I took a female of this species on the North Beach (between Grindstone Island and Grosse Isle). The skin is in my collection. I have seen no others of this species during three trips to the Magdalen Islands.

Tringites subruficollis. BUFF-BREASTED SANDPIPER.— A male of this species was secured on September 13, 1908, by my companion Mr. J. R. Gilman, on the North Beach.

Micropalama himantopus. STILT SANDPIPER.— On September 24, 1908, a single Stilt Sandpiper lit within a few feet of the blind I was occupying while shooting shorebirds on Grindstone Island. I had an excellent opportunity to observe the bird but unfortunately failed to secure it. I am positive that this bird was *Micropalama himantopus*, for I was close enough to observe its most striking characteristics. This is the latest date for the latitude that I am able to find.— WINTHROP S. BROOKS, *Milton, Mass.*

Bird Enemies of the Chinese Cotton Scale.— For several years our shade trees, especially maples and black locust, ornamental shrubs and vines, have been threatened with destruction by the invasion of the Chinese cotton scale. I have kept close watch over the pest to see if it had any bird enemies, and not until last winter was I able to satisfy myself that there were birds which sought the scale for food. A flock of twenty-five Redpolls (*Acanthis linaria*) passed the winter months in the city, and came almost daily to the maple trees about my home and fed upon the cotton scale. Their peculiar action in reaching around beneath the branches of the trees whilst feeding first attracted my attention, and with the aid of my field glasses I was able to determine their kind and what they were feeding upon.

Frequently a number of Pine Finches would associate with the Redpolls and partake of the same insect food. It is claimed by some observers that the Western Evening Grosbeak (*Coccothraustes vespertinus montanus*), feeds upon the Chinese scale, but I am inclined to doubt this assertion, from the observation I constantly had over a large flock of over one hundred which spent the winter in this city, and upon no occasion did I notice them feeding upon the scale. A friend told me he had observed the Chickadees feeding on the Chinese cotton scale and I trust that he was not deceived.

This season, for the first time, the city authorities have systematically sprayed all our shade trees with some chemical which has pretty thoroughly annihilated the scale pest, so the opportunity for study along this line will not be so favorable this winter.— W. W. Arnold, *Colorado Springs, Colo.*

RECENT LITERATURE.

McAtee's 'Woodpeckers in Relation to Trees and Wood Products.' — In this valuable and interesting publication[1] Mr. McAtee treats exhaustively a subject upon which there has been much need of authentic information. First is considered the damage done by Woodpeckers in general, to trees, telegraph poles and buildings, in excavating for nests — damage which can usually be prevented by furnishing artificial nest boxes and which rarely or never calls for the destruction of the birds. Furthermore the benefit conferred by Woodpeckers, exclusive of the Sapsuckers, in destroying insects, far more than compensates for the damage they do. With the Sapsuckers however, the case is different, and the bulk of Mr. McAtee's report is taken up with a discussion of the depredations of the Yellow-bellied and Red-breasted Sapsuckers (*Sphyrapicus varius* and *ruber*) and their geographic races. The evidence presented seems fully to warrant the author's conclusion, that these birds should be included in the class of injurious species and destroyed whenever caught redhanded. The status of Williamson's Sapsucker (*S. thyroideus*) is still in doubt owing to lack of information. The various species of trees and vines attacked by the Sapsuckers are listed systematically with comments on the character and extent of the damage inflicted, and with numerous excellent illustrations.

In puncturing the bark to reach the sap the birds injure the cambium layer, causing irregularities of growth and distortion of the grain of the wood. Furthermore the punctures admit moisture, bacteria, fungi, etc., which produce stains or decay, rendering the lumber valueless for ornamental or other special uses and sometimes causing the death of the tree.

The annual loss resulting from the Sapsucker's attacks in the United States exceeds a quarter of a million dollars. Mr. McAtee accompanies his condemnation of the Sapsuckers with a word of warning to the effect that "great care should be exercised to distinguish the real offenders, as there are twenty species of Woodpeckers in the United States and only two are under indictment."

Two excellent colored plates by Fuertes illustrate the several species of Sapsuckers, and add to the value and attractiveness of this excellent bulletin.— W. S.

Forbush on the Starling in America.[2]— In June, 1910, through the coöperation of the Bureau of Biological Survey, U. S. Department of Agri-

[1] Woodpeckers in Relation to Trees and Wood Products. By W. L. McAtee. Bulletin No. 39. Biological Survey, U. S. Department of Agriculture. Issued September 26, 1911.

[2] Annual Report of the State Ornithologist for the year 1910. Massachusetts State Board of Agriculture. July 11, 1911.

culture, Mr. E. H. Forbush was able to visit the several States in which the Starling has become established, and by personal investigation as well as by correspondence, to secure much historic and economic information concerning the bird, which is here presented. The first successful introduction of the Starling in America seems to have been in 1890, when Eugene Schieffelin liberated 120 birds in Central Park, New York City. The species has now spread over Long Island, New Jersey, Connecticut, and eastern Pennsylvania, although still most abundant in the vicinity of New York; while it has been reported from Odessa, Del.; Springfield, Mass.; Rhinebeck, N. Y., and Millersville, Pa.

As to the relation of the Starling to our native birds Mr. Forbush finds that it drives away such birds as Flickers, Bluebirds and House Wrens, by occupying their nesting places, while it competes actively with our birds for their food supply. In winter especially the flocks of Starlings scour the country so thoroughly, that they must devour most of the supply of food upon which our winter birds are accustomed to subsist. Furthermore, as Mr. Forbush says, "the Starling can give no service that cannot be equally well performed by our own Blackbirds, Meadowlarks, Bobolinks, Sparrows and other birds," while it has already "begun to show a capacity for harmfulness which may be expected to become more prominent as its numbers increase." Accounts of the great damage inflicted upon berry patches and vineyards in Europe, give us some idea of what we may expect from the unfortunate introduction of this undesirable bird.— W. S.

Strong on the Olfactory Organs and the Sense of Smell in Birds.[1] — Dr. Strong's investigations here presented were of two kinds, morphological and experimental. The former consisted of the study and dissection of the heads of sixty-five species representing twenty-seven of the thirty-five orders of existing birds; the material being for the most part that contained in the Senckenbergisches Neurologisches Institute at Frankfort-am-Main, Germany, where every facility was extended to the author by the director, Prof. Ludwig Edinger.

These studies gave evidence that (1) the olfactory organs of birds are of too great size to be set aside as non-functional, but that (2) there is a tendency in the bird series toward retrogression in these organs. In the Emu and Fulmar the olfactory lobes were found to be of relatively great size while in the Corvidæ they are surprisingly minute.

Dr. Strong's experimental work consisted mainly of experiments upon Ring Doves in a covered enclosure with four similar accessory chambers communicating with it. These were so constructed that food placed in them was not visible from the main chamber, and by aid of glass tubes and suitable apparatus air currents could be created from any of the accessory chambers which could be charged with odors as desired.

[1] On the Olfactory Organs and the Sense of Smell in Birds. By R. M. Strong. From the Hull Zoölogical Laboratory, University of Chicago. Journal of Morphology, XX, No. 3, September, 1911, pp. 619–658, pl. i-ii and figs. a–d.

The birds were first trained to search for food indiscriminately in the various chambers, and then developing an odor in the chamber containing the food record was kept as to whether or not the bird entered this chamber in preference to any of the others. The experiments were repeated a number of times and with different odorous materials. Although the birds never learned to find their food with perfect accuracy, it was evident that they were guided to some extent by at least one of the materials used; the percentage of correct entrances being notably larger than would have been expected according to the law of error.

Dr. Strong concludes that birds have a sense of smell, which in some species at least is more acute than in man. He agrees with Turner that the development of keen vision in birds is being accompanied by a degeneration of the olfactory sense, and further suggests that a mutual relation between the olfactory and visual senses may exist, which makes it very difficult for a bird to react to an olfactory stimulus only.

The literature of the subject is considered but in the case of published field observations the author says the chances of error in interpretation are so great that they have little value.

Dr. Strong has made a welcome contribution to a much mooted question, and has started a line of investigation which may be followed with profit by others. With a clear understanding of the difficulties as set forth by him and a constant check on unwarranted inference, it would seem that field observations of real value should be possible.— W. S.

Lowe's 'A Naturalist on Desert Islands.'[1]— The author here presents an account of visits to some of the remote and unfamiliar islands of the Caribbean Sea — Swan Island, Blanquilla and The Hermanos. The physical features of the islands, their inhabitants, their geological history and the origin of their fauna and flora are treated entertainingly along with the narrative of the voyage, making an interesting and readable volume. The ornithological results of the cruise have already been published elsewhere, but many observations on bird-life are given here in a more popular and detailed manner. Among the illustrations are photographs of Boobies and Frigate Birds and several maps.— W. S.

Lechner's 'Oologia Neerlandica.'— Part I of this work,[2] which was announced in the July Auk, is now at hand. It comprises text for sixty-

[1] A Naturalist | on Desert Islands | By | Percy R. Lowe, B. A., M. B. (Cantab.) | Member of the British Ornithologists' Union | With thirty-two plates and three maps | Witherby & Co. | 326 High Holborn, London | 1911 — 8vo, pp. xii + 300. 7s. 6d. net.

[2] Oologia Neerlandica | Eggs | of | Birds | Breeding in the Netherlands | By | A. A. Van Pelt Lechner | Member of the Board of the "Nederlandsche Ornithologische Vereeniging" | (Netherland Ornithological Society) | With colored plates made direct from specimens | in the author's collection | vignette | The Hague | Martinus Nijhoff | 1911. Small 4°. 250 copies printed of which 100 are in English. Part I, (Sept., 1911) comprises Plates 1–10, 12,13, 15, 16, 20, 23, 25, 27–29, 33–35, 37, 39–44, 46, 47, 76, 83, 84. Price £1.10 net.

two species and thirty-five plates, the text sheets and plates being unbound in a folder. The work is beautifully prepared, the text handsomely printed on handmade paper, the illustrations admirable color plates, each figure being mounted separately on heavy paper, three to six on a plate.

Under each family the eggs of the several species are discussed with regard to their resemblances and systematic relationship, as well as their variation in color and form; while much interesting information regarding the depth of deposit of the pigment in the shell, and the composition of the pigments, is presented. Following this is a page for each species, intended to face the plate when bound, upon which is given the "Colour of shell, colour of spots, average dimensions, average weight of shell, texture of shell, shape, nest, site of nest, number of eggs, breeding season, and duration of incubation." As a purely "oölogical" work it is one of the best that has appeared and could be studied with profit by those who desire to place egg collecting on the plane of a science instead of allowing it to become a mere fad as has too often been its fate in America.— W. S.

Berlepsch on Birds of the Aru Islands.[1]— This paper, while based primarily upon a collection made by Dr. Hugo Merton from January to May, 1908, is extended to include all species hitherto reported from the islands. References to place of publication, type locality, and published records for each species are given, which form a valuable summary of our knowledge of the birds of this interesting group. A table is appended showing the distribution of the species or related geographic races in New Guinea and other neighboring islands.— W. S.

Riley on Three New Birds from Canada[2]— In identifying a collection of birds taken on the 1911 Expedition of the Alpine Club of Canada to Jasper Park, Yellowhead Pass, and the Mount Robson region of British Columbia and Alberta, Mr. Riley finds three races which he regards as separable. A Song Sparrow, *Melospiza melodia inexpectata*, is intermediate between *M. m. rufina* and *M. m. merrilli*, apparently a case of very close splitting since the last form has been recently regarded as merely an intermediate between *rufina* and *montana*. A Fox Sparrow, *Passerella iliaca altivagans*, is based upon "two slightly immature birds from Moose Branch of the Smoky River" and some migrants from farther south. Mr. Riley's studies of the Willow Ptarmigan lead him to recognize three forms in North America, *Lagopus lagopus alexandræ* Grinnell from the southwestern coast of Alaska, *L. l. albus* Gmelin from Hudson Bay to Siberia, and a form from Ungava which he names *L. l. ungavus*.— W. S.

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[1] Die Vögel der Aru-Inseln mit besonderer Berücksichtigung der Sammlungen des Herrn Dr. H. Merton. Von Hans Graf von Berlepsch. Abhandl. der Senckenbergischen Naturforschenden Gesellschaft, Bd. XXXIV, 1911.

[2] Descriptions of three New Birds from Canada. By J. H. Riley. Proc. Biol. Soc. of Washington, XXIV, pp. 233–235. Nov. 28, 1911.

Kellogg on Winter Birds from Trinity and Shasta Counties, California.[1]— Miss Kellogg accompanied Miss Alexander on a February collecting trip into the mountains of Trinity County in the interests of the Museum of Vertebrate Zoölogy of the University of California, and in this paper presents field notes upon the thirty-eight species observed. Flocks of Bohemian Waxwings were encountered at Tower House and Helena, while Song Sparrows collected at the former station indicate, according to Miss Kellogg, that the race *Melospiza melodia morphna* is identical with *rufina;* while "there is intergradation between *montana* and *rufina,* the name *merrilli* having been applied to some such intergradient form."— W. S.

Wood on Birds of the Charity Islands, Michigan.[2]— Mr. Wood had charge of the vertebrate zoölogy on an expedition to the Charity Islands, Lake Huron, in the interests of the University of Michigan; which was made possible by the generosity of Hon. W. B. Mershon. The present paper gives an annotated list of the birds observed. Notes on 162 species are included, but as field work did not begin until August 16, satisfactory data upon the breeding species was not obtained and the annotations relate largely to the fall migration.— W. S.

Swarth on a New Hairy Woodpecker from Southeastern Alaska.[3]— Mr. Oberholser's recent revision of the Hairy Woodpeckers does not seem to have exhausted the possible races of this bird, in spite of the abundant material at his command. A series of skins from "the islands of the Alexander Archipelago and a narrow strip of mainland coast lying west of the coast range and south of the Taku River," represent, according to Mr. Swarth, a race differing from both *Dryobates villosus picoideus* and *D. v. harrisii,* which he names *D. v. sitkensis.*— W. S.

Report of the Meriden Bird Club.[4]— This attractive brochure is well calculated to arouse interest in practical protection and study of wild birds, and illustrates what a local Bird Club, or branch of the Audubon Society, may accomplish under efficient direction. Various methods of attracting birds by establishing feeding places, shelters, bird boxes, etc., are considered and illustrated, as well as the history and activities of the Club.— W. S.

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[1] A Collection of Winter Birds from Trinity and Shasta Counties, California. The Condor, XIII, pp. 118–121, July, 1911.

[2] The Results of the Mershon Expedition to the Charity Islands, Lake Huron. Birds. By N. A. Wood. Wilson Bulletin, July, 1911, pp. 78–112, with map.

[3] Description of a new Hairy Woodpecker from southeastern Alaska. By H. S. Swarth. University of California Publications in Zoölogy, Vol. 7, No. 9, pp. 313–318. Published October 9, 1911.

[4] First Report of the Meriden Bird Club, 1911. Boston, Mass. [published by the Club, Meriden, N. H.] 8vo., pp. 67. 18 half-tone plates.

Cooke on the Distribution of the American Egrets.[1]— This circular consists of two maps showing by actual records the original distribution of the Egret, *Herodias egretta*, and the Snowy Egret, *Egretta candidissima*, with brief remarks upon their past and present range. "Fortunately," says Prof. Cooke, "in the case of each of these species, breeding colonies still remain in the southern United States to serve as centers of distribution to the districts formerly included in the range." So long however as States like Pennsylvania afford these birds no protection, and the pot hunter shoots at every "white crane" that strays north of the present limited breeding range, the outlook for the extension of this range to its former limits is discouraging.— W. S.

Fleming on a New Teal from the Andaman Islands.[2]— Mr. Fleming finds that six specimens of *Polionetta* recently received from North Reef Island, west of North Andaman, differ constantly from specimens of *P. albigularis* from South Andaman, and he proposes to separate them as *P. a. leucopareus*.— W. S.

Rubow's 'Life of the Common Gull'[3]— This is an English translation of the original Danish edition already reviewed in these pages, with the same excellent series of illustrations.— W. S.

Gentry's 'Life-Histories'— A Belated Review.[4]— These volumes were not adequately reviewed when first issued, nor since, so far as the writer is aware. As if by common consent they have been very consistently ignored by American ornithologists. Although the writer believes that untrustworthiness in supposedly scientific work should be fully exposed, he has up to the present acquiesced in the silent treatment of Gentry's volumes. Now, after a lapse of more than 30 years, comes a case which shows how necessary it is for those to point out errors who are enabled to do so by familiarity with the subject or the man. It would not be necessary to discuss the character of a work so generally consigned to oblivion, were it not for the fact that it now seems to be taken seriously abroad. Mr. G. A. K. Marshall, in presenting a collection of the records of birds attacking butterflies (in Trans. Ent. Soc. Lond., 1909, pp. 329–383) quotes freely

[1] Distribution of the American Egrets. By W. W. Cooke. Circular 84. Bureau of Biological Survey, U. S. Department of Agriculture. Issued September 13, 1911. pp. 5.

[2] A New Teal from the Andaman Islands. By J. H. Fleming. Proc. Biol. Soc. of Washington, XXIV, pp. 215–216, Oct. 31, 1911.

[3] The Life of | the Common Gull | told in Photographs | By | C. Rubow | Translated from the Danish | Witherby & Co. | 326 High Holborn, London, W. C. | 1911 — 8vo, [pp. 6], 25 illustrations from photographs from life.

[4] Gentry, Thos. G. Life-Histories of the birds of eastern Pennsylvania, Vol. I, 399 pp. Published by the author, Philadelphia, 1876. Vol. II, 336 pp. Salem, Mass., 1877.

from Gentry's 'Life-histories,' he of course taking them for bona fide and reliable records, which they are not. A majority of Mr. Marshall's records for North America come from these books.

The writer is not the first to take exception to the quality of Gentry's works, as anyone can learn by consulting Dr. C. Hart Merriam's review of the 'Illustrations of Nests and Eggs of Birds of the United States' in the Bulletin of the Nuttall Ornithological Club, Vol. VII, No. 4, Oct., 1882, pp. 246–249.

The phase of the 'Life-Histories of the Birds of Eastern Pennsylvania' with which we are at present most interested is the voluminous records of bird food which the book contains. It is averred in the preface that more than 700 stomachs of birds were examined. For many of the species of birds lists of from 20 to more than 50 specifically named vegetable and animal food items are given, and the writer is shrewd enough to give quite an appearance of plausibility to these accounts, in that they conform in a way to the commonly observed feeding habits, and the carnivorous or vegetarian tastes of the species. It is manifest, however, that an investigator cannot present lists of from 20 to 50 insects and seeds for more than a hundred species of birds from the examination of 700 stomachs. Seven stomachs per species would certainly not yield so great a variety of items in condition to be fully identified — they might yield no more than three or four. An obtrusive feature of the lists is the recurrence of the same insect names over and over again. These things are against all experience in stomach examination.

Let us examine definite cases in which our glib author goes astray. In his account of the food of the Mourning Dove (Vol. II, p. 304) he lists 8 kinds of insects specifically besides grasshoppers. One is a species of *Harpalus*, a large and hard insect which would perhaps be the last we should expect a dove to swallow. Examinations of more than 250 stomachs in the Biological Survey, and of more than 220 by Mr. E. A. Schwarz of the Bureau of Entomology, show the Mourning Dove to be almost a complete vegetarian. A list of 12 binomial "identifications" is included in the account of the Hawk Owl, a species which occurs in Pennsylvania only in severe winters, and very rarely then. On one page Gentry says he has often seen this bird feeding, while on another he says it is only occasionally met with. Lizards and *Plethodon erythronotus* are mentioned as food items, but it is not explained how this northern breeding bird would get these southerly forms which are dormant during its visits to their range. The same remarks apply to his citation of *Plethodon erythronotus* and *Pseudotriton* [*Spelerpes*] *ruber* as food of the Snowy Owl. The Rough-legged Hawk is said to feed on many snakes, frogs, shrews, moles, bats, weasels and birds, items that subsequent stomach examinations have yielded rarely, if at all.

Six species of spiders are listed as prey of the Ruby-throated Hummingbird, a better record than the Biological Survey has been able to get from the examination of 59 stomachs, and the assistance of the foremost arach-

nologist in the country. Gentry records several species of lepidopterous larvæ as food of nestling Chimney Swifts and Nighthawks, when in fact the food of the young of these species does not vary appreciably from that of the adults and the latter take very few caterpillars.

Twenty species of insects are recorded as food of the Olive-sided Flycatcher, a rare species in eastern Pennsylvania, almost as long a list as the Biological Survey has been able to accumulate from an examination of 63 stomachs. Suspiciously full notes are given for such rare species (in Pennsylvania) as the White-winged Crossbill, Mourning, Connecticut, and Cerulean Warblers. We may inquire also into his statements as to the occurrence of the birds themselves. For instance he says (Vol. I, p. 311) of the White-crowned Sparrow, "from the 20th of April to the middle of May it congregates in flocks of a dozen or more .... Whilst writing, May 4, vast numbers are daily observed within our gardens and the adjoining fields." The facts are that this sparrow is rare everywhere east of the Alleghenies, and probably never have vast numbers been seen about Philadelphia.

If this work of Gentry's were scientifically accurate, it would now rank as a classic. But regarded with suspicion at first and latterly ignored, its most obvious defect is that it looks too good. Gentry even claims to have identified the eggs and pupæ of certain species of *Cratonychus* (now *Melanotus*), a thing which is to-day impossible for even the best coleopterists.

The 'Life-Histories of the Birds of Eastern Pennsylvania' must be known then as a dangerous mixture of fact and unfact. Its accuracy in some respects gives it a deceptive appearance of verity, but with regard to the records of bird food it is certain that the only safe course is to regard them as almost entirely products of the author's imagination.— W. L. M.

African Economic Ornithology.— An important paper by Austin Roberts distinguishes that writer as a pioneer expounder of the 'Economics of Ornithology in South Africa.'[1] The author considers birds in relation to grain, fruit, poultry, and stock, and also gives a list of scavengers, and of birds suggested for protection. Mr. Roberts says: "Before the advent of white men in South Africa birds affected even the primitive agriculture of the natives; the patchy fields of corn had to be guarded against the same granivorous birds which now trouble us. But the conditions of that time differed widely from those obtaining now, as the grain fields were small and easily protected .... Soon after the settlement of the country by white men a new feature arose in the introduction of cultivated fruit. Frugivorous birds, formerly dependent upon the precarious supplies of Nature, soon learned to appreciate the better quality and greater quantity placed within their reach, and it is not surprising that they forsook the

[1] Agr. Journ. Union of S. Africa, I, No. 3, April, 1911, pp. 352–369.

wild fruit when that in the orchards began to ripen." Most of the damage to grain is done by finches resident about the fields, and more than 16 species are mentioned, together with notes on their ravages. Some 25 to 30 species are listed as granivorous, but not as yet harmful, while four kinds of doves and pigeons, one crow and a crane are said to indulge in pulling newly sown grain.

The birds injurious to fruit comprise a greater variety including colies, bulbuls, starlings, glossy starlings, parrots, hornbills, white-eyes, sunbirds, and pigeons. Other fruit eaters mentioned are lories, barbets, fruit pigeons and willow warblers.

The avifauna of South Africa is characterized by great variety of scavengers and rapacious birds. Among the enemies of poultry are 3 species of *Astur*, 2 of *Accipiter*, 2 of *Micronisus*, 3 of *Falco*, 1 *Buteo*, 2 *Spizaetus*, 1 *Hieraætus*, 1 *Aquila*, 1 *Milvus*, 1 *Melierax*, 1 *Circus*, 2 *Circaetus*, and 2 *Bubo*. Five or more other hawks and owls are mentioned as occasional depredators of the poultry yard. The damage is considerable at times, being most severe when the predatory birds are rearing their young. Mr. Roberts believes in protecting poultry, so far as possible, with wire netting, but remarks that this form of protection is not available for game. He states that "There is no means of protecting game from the attacks of vermin except by getting rid of the most destructive kinds, and the results of so doing will seriously affect other interests. At present the country is not in a position to undertake the destruction of any class of bird, and it will have to remain over until a sounder knowledge of their habits has been obtained."

The birds that have a beneficial relation to stock, that is, as tick destroyers, include the oxpeckers, one species of egret, one crow and one starling. Those troublesome to stock farmers, mainly because of attacks on lambs, are 4 eagles of the genera *Spizaetus* and *Aquila*, a lammergeier, a vulture, and a raven. The scavengers listed include 6 vultures of 5 different genera, 2 eagles, generically distinct, a kite, 2 crows and one stork.

In his remarks upon protection, the author presents some very sensible views regarding the tendency for economic values to vary locally, and the advantage of each district having a protected list of its own. He further says: "Only wholly useful birds should be protected, because farmers and others must be allowed to protect their own interests." The birds suggested for protection as friends of the stock farmer are oxpeckers and the buff-backed egret; as consumers of locusts and termites, pratincoles, black stork, white stork and wattled starling; as destroyers of small vermin and insects, kestrels, black-shouldered kite, owls (except the three largest species), swallows, swifts and wagtails; as being beautiful and likely to be exterminated, bluejays or rollers, and the crested crane. Mr. Roberts notes that the English sparrow, although introduced long ago, has not spread very far or become a nuisance, while the common starling of only 25 years standing has become injurious about Capetown.

Another paper on the food of African birds is of greatest interest in its bearing on the relation of birds to insects supposed to be protected by their color, or to show by their color that they are not edible. Mr. G. L. Bates in 'Further notes on the Birds of Southern Cameroon'[1] gives a résumé of the results of six years' field examinations of the stomachs of African birds. He found Coleoptera in 213 stomachs, Orthoptera in 177, ants in 57, other Hymenoptera in 8, scale insects in 32, bugs in 19, termites in 31, slugs and snails in 24, spiders in 85, millipeds in 20, and butterflies in none. Ants, particularly those of tropical countries, are classed by theorists as protected insects, and much is made of their so-called mimics among various other insect orders, yet ants rank fourth in importance in this list of bird foods. The theories that have been built up to explain the mimicking coloration of many butterflies as a result of natural selection absolutely require for their substantiation proof that birds regularly prey upon these insects. Evidence thus far urged as proof of this habit is largely based on experiments with captive birds. As the writer has pointed out in another place,[2] the results of such experiments have very little if any value as indicating behavior under natural conditions. Actual examinations of bird stomachs reveal butterflies in an exceedingly low proportion of North American birds, and the results of Mr. Bates's examinations during 6 years (in which time 178 stomachs were carefully examined with this particular point in mind), a larger body of good evidence than anyone else is able to produce for tropical birds, are worthy of the serious consideration of the selectionists who have postulated the necessary support for the mimicry theories in the heretofore almost wholly unknown, hence easily and agreeably hypothecated conditions of the tropics.— W. L. M.

Todd and Worthington's 'A Contribution to the Ornithology of the Bahama Islands.'— This paper[3] is based upon a collection of 591 skins obtained by Mr. W. W. Worthington, December 28, 1908, to May 8, 1909, on the islands of New Providence, Great Inagua, Acklin, Watlings, Andros and Abaco, and later acquired almost in its entirety by the Carnegie Museum. The critical portion is by Mr. Todd and the 'Narrative and Field Notes' by Mr. Worthington. As the authors present their information in two entirely distinct lists in which the same species usually bears different numbers, an unnecessary burden is inflicted upon any one who may consult the paper. Eighty-four species are treated by Mr. Todd and one hundred and twenty by Mr. Worthington.

In his introduction Mr. Todd discusses the zoölogical relationship of the Bahamas both with relation to each other and to adjacent islands

[1] Ibis, 9th ser., V, No. 20, Oct., 1911, pp. 630–631.

[2] Journ. Econ. Ent., 3, No. 5, Oct., 1910, pp. 437–438.

[3] A Contribution to the Ornithology of the Bahama Islands. By W. E. Clyde Todd and W. W. Worthington. Annals of the Carnegie Museum, VII, Nos. 3–4. Issued, October, 1911.

and the continent of North America. His conclusions agree with those already advanced by Mr. Chapman and Mr. Riley.

A number of new records are established for several of the islands visited, and a new warbler, *Dendroica flavescens*, already described by Mr. Todd (Proc. Biol. Soc. Washington, XXII, p. 171) was discovered on Abaco.—W. S.

Mathews's 'The Birds of Australia.'—Part 5[1] bears date October 31, 1911, and completes the first volume, except the introductory matter and index, which will form Part 6, and when ready will be sent to subscribers without extra charge. The first volume warrants the liberal praise bestowed upon Part 1 (Auk, XXVIII, p. 135, 136), as regards the character of both the text and plates; and the Parts have thus far appeared with commendable promptness and regularity. The present Part concludes the Ralliformes, and includes also the Podicipediformes and the Sphenisciformes, the species treated being numbered 64–74. In addition to the technical and biographical matter usual to works of this character, the relations of the Australian forms to their congeners are considered, the genera, species and subspecies being critically revised from the author's viewpoint in respect to status and nomenclature. In the present Part the new genus *Mantellornis* is established, with *Notornis hoeckstetteri* Meyer as the type. Two new subspecies of *Porphyrio* are described as *P. melanotus fletcheræ* (Tasmania) and *P. m. ncomelanotus* (Northwest Australia), and the little known *Fulica alba* White is considered at length. The only two specimens known to be extant came probably from New Zealand. Three other new forms here described are *Podiceps cristatus christiani*, *Aptenodytes patagonica halli*, *Eudyptula minor iredalia*. We regret that we are unable to agree with Mr. Mathews in the use of *Podiceps* in place of *Colymbus*, and of *Penguinus* in place of *Catarractes*, for reasons already given (Auk, XXVIII, 1911, p. 496). Mr. Mathews now designates as type of *Penguinus*, *Aptenodytes chrysocome* Forster (1781), instead of *Phaëthon demursus* Linné, formerly designated by him or the type. Contrary to most previous authors, he now considers Linné's species indeterminable. He states that it, "though undoubtedly a 'Crested Penguin,' is obviously a young bird, and unfortunately must be regarded as indeterminable. Brunnich's genus was certainly founded on the characters of this bird, but as no species was named by him, I herewith designate *Aptenodytes chrysocome* Forster as the type of Brunnich's genus,"—a species, by the way, not described till eleven years after Brünnich's genus was founded! Yet he adds: "The course I now advocate I consider better,

[1] The Birds of Australia. By Gregory M. Mathews, Member of the Australian Ornithologists' Union and the British Ornithologists' Union. With hand-coloured Plates. Volume I, Part 5, London: Witherby and Co., 326 High Holborn, W. C. October 31st, 1911. Roy. 4to, pp. 325–286, pll. 59–67, with 3 full-page text cuts. Price, £2. 2s. per part.

as tending to give more stability to our nomenclature."[1] This is certainly a new departure in type designation, it generally being held that in the case of speciesless genera the type must be some species described before the founding of the genus on which the genus was obviously based. If *Penguinus* was founded on an indeterminable species, the genus itself must necessarily share the fate of the species on which it was founded. Such action is antagonistic, in spirit if not in letter, to Article XXX of the International Code of Nomenclature, which provides that the type selected must be one of the originally included species. Although the characters of *Penguinus* might fit several then undescribed species none of them, when later described, can be properly available as its type.— J. A. A.

Abbott's 'The Home-Life of the Osprey'.— In a little volume[2] of 53 pages of text and 45 photographic illustrations, Mr. Abbott is able to give an account of the home-life of the Osprey, or Fish Hawk, in minute detail, from long study of the species at various points on the coast of New Jersey, at Gardiner's Island, New York, and at Great Lake, North Carolina, beginning with its arrival in the waters near New York about the end of March and ending with its departure early in October. Although the subject is not a new one, Mr. Abbott has made excellent use of his opportunities and, aided by the camera, has given us a thoroughly complete history of the 'home-life' of this interesting species, as studied particularly at Gardiner's Island and along the coast of New Jersey. Every feature is beautifully illustrated in the accompanying photographs, mostly taken by himself. The varied character of its nesting-sites and nests, its manner of fishing, the care of its young, their development and behavior while in the nest, the devotion of the parent birds to their young and to their homes, its manner of fishing and carrying its prey, are all sympathetically told in the text and effectively illustrated in the excellent plates. The work is a worthy successor of the similar monographic studies that have preceded it in the 'Bird-Lovers' Home-Life Series' of its enterprising publishers, Witherby and Co. of London. In concluding his excellent monograph Mr. Abbott says: "There is a nobility and dignity about this bird, an industry and inoffensiveness of life, a tender affection for its mate and young, that can only bring increasing admiration with acquaintance."— J. A. A.

Publications Received.— **Abbott**, Clinton G. The Home-Life of the Osprey. Crown 4to, pp. 44, 32 photographic plates. London, Witherby & Co. 6s. net; special ed., 10s. 6d. net. New York, Brentano, $2 post-paid.

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[1] Not italicised in the original.

[2] The Home-Life | of | the Osprey | Photographed and Described. | By | Clinton G. Abbott, B. A. | Associate of the American Ornithologists' Union | With some Photographs by Howard H. Cleaves, Associate of | the American Ornithologists' Union | With Thirty-two mounted plates | London | Witherby & Co., 326 High Holborn, W. C. | MCMXI.— pp. 54, 32 photographic pll. Cloth, 6s. net; special edition, 10s. 6d. net. For sale also at Brentano's, 229 Fifth Avenue, New York. $2 post-paid.

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CORRESPONDENCE.

Cooke's 'Distribution and Migration of North American Shorebirds.'

To the Editor of 'The Auk:—

Dear Sir:—The comments made by Mr. F. H. Allen in 'The Auk' for October, 1911, on certain shortcomings in Cooke's 'Distribution and Migration of North American Shorebirds' seem to call for a few words in reply. I trust to make these as courteous in tone as were the comments.

It is claimed by Mr. Allen that the facts given under the several species are not complete enough to justify the statement made in the introduction, and on a subsequent page, as to the scope of the bulletin. Thus, to show the insufficiency of the data on the breeding and wintering of certain of the Shorebirds, he states that the Northern Phalarope "is a common summer resident in Labrador and breeds along the entire coast," and adds that Cooke might easily have ascertained this by consulting the 'Birds of Labrador' by Townsend and Allen. The fact is that these authors kindly sent Prof. Cooke a copy of their most excellent work immediately after it was published, that it has been on his desk ever since, and has been frequently and profitably consulted. In their statement in regard to the breeding of the Northern Phalarope in Labrador, however, there is reason to believe that the authors are mistaken. Hence their statement, though by no means overlooked, was not accepted.

The present status of the Northern Phalarope as a breeding bird in Labrador is far from satisfactory. In Vol. III of his 'Ornithological Biography,' Audubon gave a circumstantial account of the discovery of the nest and eggs of the bird in Labrador, ending with the statement that "both young and old had departed by the beginning of August." This account of the breeding of the species is explicit enough, and would be entirely satisfactory were it not for the fact that it sharply conflicts with the equally circumstantial account by the same author in his journal, where we find that the only time he mentions seeing the species, is on July 29, when he states:

"I saw this afternoon two, or a pair, of the *Phalaropus hyperboreus*; they were swimming in a small fresh-water pond, feeding on insects, and no doubt had their nest close by, as they evinced great anxiety at my approach. I did not shoot at them, and hope to find the nest or young; but to find nests in the moss is a difficult job, for the whole country looks alike." It thus appears that up to July 29 he had found no Phalarope nests, and, as it seemed to Prof. Cooke impossible to reconcile the two accounts, he decided to pass by Audubon's breeding record, especially since it has not been substantiated by later investigations.

June is preëminently the breeding month for this phalarope. Numerous June records are at hand for different localities in Canada and Alaska, comparatively few are as late as July. It is significant that of 70 nests found by McFarland at Fort Anderson, July 10 was the latest date, most of them, even in this far northern locality, being in June. In more southern localities, the bird would naturally be expected to nest earlier.

The fall migration of the Northern Phalarope is well under way by the middle of July, so that the mere presence of the birds anywhere after that date cannot be accepted as definite proof of breeding. The two birds seen by Audubon July 29 were doubtless migrants, and the date agrees well with the dates at which migrating phalaropes have been noted by subsequent observers. Brewster found no nests in the Gulf of St. Lawrence region, and does not record the bird as absolutely identified by him until July 25; Bigelow found no nests, and saw no birds until July 23. It is true that in his 'Birds of Northeastern Labrador' published in 'The Auk' for January, 1902, he gives the bird as "Common. Breeding in almost all the suitable marshes; occasionally very abundant off-shore." This again on its face value would be satisfactory as to the essential fact that this phalarope breeds on the Labrador coast but in a recent letter to Prof. Cooke, Mr. Bigelow states that he did not find *nest or eggs of the bird* but found the birds in the marshes at Poutes Cove on July 23 [thus well within the migrating period], and adds that his reason for stating that they breed there was that the natives assured him the birds observed [in 1902] were nesting. While this testimony by the natives may have been convincing to Mr. Bigelow, it cannot, we submit, without further evidence, be accepted as definitely establishing the breeding of the species in the locality in question, especially when is taken into account the late date, July 23.

Townsend and Allen found neither nests nor young, and saw no birds until July 27. Hence the statement in their 'Birds of Labrador' that "The Northern Phalarope breeds along the entire Labrador coast in freshwater marshes on the borders of ponds and lakes" would appear to have been based on the statements of the authors they subsequently name (Audubon, Low, Bigelow, Turner and Spreadborough) rather than on their own observations. If the species really breeds generally on the Labrador coast, it should have been noted by Coues, who had far better opportunity of observation than any of the observers above mentioned. As a matter of fact he did not find the bird at all, while Low, who afterwards visited the same district, does not mention meeting with the bird in the breeding season until June 13, when he was far inland from "Labrador" near the head of the Hamilton River. Spreadborough's account refers to James Bay and hence has nothing to do with the Labrador coast. So that as the matter now stands, "Ungava Bay, about 59° N. (Turner)" is the most southern certain record of the breeding of the Northern Phalarope on the Atlantic coast, as is given in Bulletin 35,'Distribution and Migration of North American Shorebirds.'

A word may be added in regard to the breeding and winter ranges of the

several species treated in the bulletin. It was intended to make the report as complete as possible in this respect. It was being written at the time the third edition of the A. O. U. Check-List was in course of preparation, and both literature and museums were ransacked to make the statements on these two phases of the subject as complete and exact as time and pains could make them. While it is too much to expect that the bulletin is faultless in these regards, nevertheless in the year since it was published no one has pointed out any defects, and during that period of work on ornithological literature, Prof. Cooke has found no omissions that should have been included. No doubt, however, it will be found later that matter was omitted that might profitably have been utilized, and we shall be duly grateful to friends who will call our attention to such omissions with a view to greater completeness in future publications on the same general subject.

Turning now to the migration side of the question, an entirely different problem is presented. No claim is made or even suggested in the bulletin that the data presented on migration are full and complete. In fact the explicit statement is made that the dates of migration "have been obtained principally from the migration schedules" in the possession of the Biological Survey. Ornithological literature, especially of the present time, is too voluminous for one man, however industrious, to transcribe all the dates of occurrence. In the case of this particular bulletin another item had to be taken into account. The size of the bulletin was necessarily limited to 100 pages, and this allowed only a small part even of the migration data now in hand to be used. Our records contain 45,000 cards on the Limicolæ, alone, an amount of material far too great to be more than abstracted in a bulletin of such limited size.

The failure to include in the Shorebird bulletin the data from two such important works as the ones our critic mentions: 'Birds of Essex County' by Townsend, and 'Birds of the Cambridge Region' by Brewster, can neither be explained nor defended except on the ground of human liability to error. In a work which necessitates the consultation and transcription of such a vast amount of literature no author is liable long to escape criticism for errors and omissions, and we shall endeavor to accept our share of merited rebukes with becoming resignation.

In conclusion a word may be added in regard to the great mass of ornithological data now on file in the Biological Survey. This includes over 700,000 cards from all sources, migration schedules, specimens in museums and in the hands of private collectors, and references to ornithological literature. With regard to the last named source, Prof. Cooke has about completed the abstracting of the standard serials, the government publications, the various State lists, and has made considerable progress with the multitude of non-serial publications. He has consulted nearly every American reference quoted by Coues in his three bibliographies and more than twice as many in addition, the whole making more than 20,000 titles and considerably over 200,000 notes on species. It would seem that this amount of material, while confessedly by no means covering the entire

field, is worthy of a more complimentary statement than the one penned by our critic to the effect that the bulletin on Shorebirds contains in addition to official data "*some* reference to the literature."

Very truly yours,

HENRY W. HENSHAW.

Washington, D. C., Nov. 20, 1911.

Mathews's Notes on Nomenclature.

TO THE EDITOR OF 'THE AUK':—

Dear Sir:— In the last number of 'The Auk,' I have been granted an extended review of my notes on Nomenclature published in the Novit. Zool., Vol. XVII, pp. 492–503, Vol. XVIII, pp. 1–22, Emu, Vol. X, pp. 317–326, and Vol. XI, pp. 52–58. That review will be widely read by American ornithologists whereas my original papers will not have such an audience. Inasmuch, therefore, as I feel my views have been somewhat vigorously treated, I would claim space for a short defence of my papers.

The review is principally a defence of the Brissonian genera without recourse to the refutation of the facts I produced against their acceptation. I implicitly obey the "Laws formulated by the International Congress of Zoölogists," and the reviewer wrote: "Instead of accepting, however, the ruling of the Commission on the meaning of its own Code he proceeds to argue that the Commission is wrong"; and then: "It is hard to reconcile this action with his repeatedly professed absolute adherence to 'the laws formulated by the International Congress of Zoölogists.'"

The reviewer has confused the Laws with the Opinions rendered by the Commission. I have never questioned the Laws and "the Commission has no legislative power." Refer to Opinion 16, where after nine pages of discussion the only cases where an Opinion was necessary were left to be decided by the first author who had occasion to use them, and the sentence passed "If any author attempts to construe the cases under the present ruling the burden of proof to show he is justified in this procedure rests upon him."

However the reviewer further wrote: "As a matter of fact, it is perfectly evident that the Commission intentionally employed the term binary for the purpose of conserving genera established by non-binomial authors of dates subsequent to 1758," yet carefully refrained from noticing my appeal to the Laws which I here again quote:

"*Article 25.* The valid name of a genus or species can be only that name under which it was first designated on the condition:

"*a.* That this name was published and accompanied by an indication, or a definition or a description; and

"*b.* That the author has applied the principles of binary nomenclature.

"*Article 26.* The tenth edition of Linné's 'Systema naturæ,' 1758, is the work which inaugurated the consistent general application of the binary

nomenclature in zoology. The date, 1758, therefore, is accepted as the starting point of zoological nomenclature and of the law of priority."

Inasmuch as the meaning of the word binary, here first used instead of binomial, is explained by the context it can have none other than what I have claimed. I cannot imagine the arguments whereby the reviewer could make it "perfectly evident, as a matter of fact," to be otherwise; from the facts which I have here quoted, I cannot admit any other meaning of binary than binomial and until Article 26 is altered I must maintain the position I have taken up. It has been suggested by supporters of the Commission's Opinions that, my arguments, on the facts, being unanswerable, this course should be adopted. Is further discussion necessary? The untenability of the Commission's Opinion is thereby admitted.

With regard to the reviewer's remarks: "Unfortunately for Mr. Mathews his statements in regard to Brisson and *Colymbus* are erroneous." "If Brisson's genera continue to be used, as they certainly will be, *Podiceps* is properly to be construed as a homonym of *Colymbus* (Brisson ex Linné)."

Whether my statements be regarded as erroneous or not depends upon whether they are criticised from the standpoint of opinion or of facts. I was only dealing with the latter and herewith point out the difference between the reviewer's opinion and facts. Reference to Brisson, Vol. VI, p. 33, does not lead us to conclude that Brisson used *Colymbus* ex Linné, and on p. 34 Brisson calls La Grebe *Colymbus*. By application of a method of tautonymy this could be accepted as the bird reckoned as type of Brisson's genus and accordingly the one from which Brisson formed his generic name. Now the first reference under that species reads *Colymbus Moehr. Avi. Gen. 77*, and no mention is made of Linné though ten references are given.

Now, whose statements are erroneous as to the origin of Brisson's *Colymbus*, the reviewer's or mine? It would be most interesting reading for me to see the reviewer's justification (on facts) of the statement "Brisson did it [subdivided a Linnean genus] in a large number of cases, intentionally and with good effect, adopting most of them in a restricted sense."

Allen, when collating the Brissonian and Linnean Genera (Bull. Amer. Mus. Nat. Hist., Vol. XXVIII, pp. 317–335, 1910), noted (p. 319) that Brisson only had Linné's 10th Edition after four volumes (out of six) of his work had been printed; he could not have subdivided many of the Linnean genera under those conditions, unless genera introduced BEFORE 1758 are admitted. An examination of those two last volumes does not reveal, to me, facts in support of the reviewer's statement.

The reviewer notes: "*Marila* Oken is rejected in favour of *Nyroca* Fleming on the assumption that Oken's bird genera of 1817 are untenable."

It is peculiar that though the A. O. U. Check-List, p. 74, includes *Marila* Oken 1817, and p. 76, *Clangula* Oken 1817, on p. 79, *Somateria* Leach 1819 is used though there is the prior EIDER Oken 1817. On p. 80 *Oidemia* Fleming 1822 is retained though there is the prior MACREUSE Oken 1817;

and p. 47 *Anous* Stephens 1826 though there is the prior Noddi Oken 1817. Why this inconsistency? I have consistently rejected all the Oken names. If they are tenable why did not the A. O. U. include all, in the Check-List? Were they in doubt as to the Latin form of the neglected names?

The reviewer further notes: "*Œnanthe* Vieillot is accepted for the Wheatears on the ground that the type of *Œnanthe* rested on tautonymy (*Motacilla œnanthe* Linn.) before a type was fixed for *Motacilla*." This is a quaint summary of my note regarding the nomenclature of the Wheatears and Chats and scarcely in accordance with the facts.

The other matters wherein the reviewer differs from myself can be regarded as matters of opinion upon which I prefer to leave myself to the judgment of the succeeding generations. It is being proven every day that in science right will right itself, and I am simply working for the advancement of the science I love, that of Ornithology.

Gregory M. Mathews.

Langley Mount,
Watford, England.
18/11/11

[The reviewer of Mr. Mathews's papers on the Nomenclature of Birds regrets that his criticisms of certain opinions held by their author has given him cause for a reply, inasmuch as the reviewer fails to see wherein he was at any point in serious error. Respecting Mr. Mathews's position in the matter of Brissonian genera, the reviewer is quite content to let him have the last word until the International Commission has formally rendered an opinion on their availability and the Congress itself has either adopted or rejected it, and then to abide by the decision of the Congress.

The question of *Podiceps* and *Colymbus* is, however, a separate issue which can be discussed wholly on the basis of facts. As Mr. Mathew truly says: "Whether my statements be regarded as erroneus or not depends upon whether they are criticised from the standpoint of opinion or of facts. I was dealing with the latter and herewith point out the difference between the reviewer's opinion and facts. Reference to Brisson....[etc., see Mathews above]. Now whose statements are erroneous as to the origin of *Colymbus* [*i. e.*, whether from Linné, 1758, or from some earlier source], the reviewer's or mine?" He says further: "It would be interesting reading for me to see the reviewer's justification (or facts) of the statement 'Brisson did it (subdivided a Linnean genus) in a large number of cases, intentionally and with good effect, adopting most of them in a restricted sense.'"

The reviewer will here endeavor to give Mr. Mathews this "interesting reading," taking the case of *Colymbus* first, and then a few other genera, — all from Brisson's last two volumes, which were printed *after* he received Linné's ed. 10 of the 'Systema Naturæ,' — which Brisson subdivided "intentionally and with good effect."

First as to the origin of *Colymbus*. *Colymbus* is essentially the same group, with the same name, in Linné's ed. 6 (1748) as in his ed. 10 (1758),

and Moerhing's *Colymbus* is simply Linné's genus of 1748, which he cites, but of course without mention of any species. But so far the origin of Brisson's genus *Colymbus* is concerned, it is necessary to go back only to Linné's 1758 edition of the 'Systema,' although Mr. Mathews seems to imply otherwise. He says: "Reference to Brisson, Vol. VI, p. 33, does not lead us to conclude that Brisson used *Colymbus* ex Linné, and on p. 34 Brisson calls La Grebe *Colymbus*. . . .Now the first reference under that species reads *Colymbus Moehr. Avi. Gen.* 77, and no mention is made of Linné though ten references are given." This statement is quite true as regards Brisson's cited references under his first species, but it has no material bearing on the point at issue, as shown by the following *facts*.

Colymbus Linné, 1758, contained 4 species: (1) *arcticus*, (2) *cristatus*, (3) *auritus*, (4) *podiceps*, the first being a loon, the other three grebes. Each of the three grebes are duly cited by Brisson in his Vol. VI, as follows: (1) " Colymbus cristatus. *Linn. Systh.* [sic] *Nat. ed.* 10. *Gen.* 68. *sp.* 2." p. 46; (2) "Colymbus auritus *Linn. Systh. Nat. ed.* 10. *Gen.* 68, *sp.* 3." p. 50; (4) Colymbus. . . .Podiceps *Linn. Systh. Nat. ed.* 10. *Gen.* 68. *sp.* 4." p. 63. Linné's remaining species, *arcticus*, is cited in the same Volume, p. 115, under *Mergus*, as: "Colymbus Arcticus *Linn. Systh. Nat. ed. 10.* Gen. 68. *sp.* 1."

Thus Brisson divided Linné's genus *Colymbus* of 1758 (ed. 10) into two by retaining all the grebes in *Colymbus* and removing the single species of loon to his genus *Mergus* (not *Mergus* Linn., 1758 and 1748) in which he placed all the other loons known to him, thus bringing all the grebes together in one genus and all the loons together in another, for the first time completely separating them as distinct genera. He conserved Linné's generic name *Colymbus*, in which he retained three of the original four species, and made a new genus for the fourth. If this is not subdividing Linné's genus *Colymbus*, and on the basis of Linné's ed. 10, I fail to understand the meaning of the word subdivide!

This is only one instance out of 14 where Brisson subdivided Linné's genera in Vols. V and VI of his work on the basis of Linné's ed. 10, which he cites throughout both of these volumes, giving references not only to this edition, but in each case citing the genera and species by numbers as well as by name, in the manner illustrated above under *Colymbus*, and generally in addition to this quoting Linné's diagnosis in full. These other 13 genera, taking them in the order of Brisson's work, are the following:

Struthio, divided into 4 genera — *Struthio, Rhea, Casuarius, Raphus*, the original genus *Struthio* being conserved in its present modern sense.

Charadrius, divided into 2 genera — *Pluvialis* and *Himantopus*. In this case the original name is replaced by *Pluvialis*.

Tringa was divided into 5 genera — *Tringa, Vanellus, Arenaria, Glareola, Phalaropus*, in this case the original name being conserved.

Scolopax, divided into 3 genera — *Scolopax, Limosa, Numenius*, the original name conserved.

Ardea, divided into 3 genera — *Ardea, Ciconia, Balearica*, the original name conserved.

Fulica, divided into 3 genera — *Fulica, Porphyrio, Galinula*, the original name conserved.

Alca, divided into 2 genera — *Alca* and *Fratercula*.

Diomedea, divided into 2 genera — *Albatrus* and *Spheniscus*.

Phaëthon, divided into 2 genera — *Lepturus* and *Catarractes*.

Larus, divided into 2 genera — *Larus* and *Stercorarius*.

Anas, divided into 2 genera — *Anas* and *Anser*.

Pelecanus, divided into 3 genera — *Onocratalus, Sula, Phalacrocorax*.

The same method with reference to Linnean genera was pursued by Brisson in his first four volumes as in his last two, with the difference merely that he had not Linné's ed. 10 to consult at the time his first four volumes were printed and he accordingly had no recourse but to take them from the 1748 edition. This matters little, since the genera under discussion are the same in the 1748 edition as in the 1758 edition, except that in some instances a few more species were included in them in 1758 than in 1748. These also number 14, which Brisson divided into 33 genera, nearly all of which are still current, many of them with the limitations Brisson originally assigned them.

The reviewer's "quaint summary" of Mr. Mathews's note on *Œnanthe* was not intended as a summary of his note, but as a statement of certain conditions in the case, and as such is correct.

Respecting *Marila* Oken, and the other Oken genera of 1817, the reviewer is willing to abide by any ruling of the International Congress respecting them but confesses that his sympathies and inclinations are, personally, with Mr. Mathews.

J. A. Allen.]

NOTES AND NEWS.

Dr. J. A. Allen finding that his health demanded relief from some of his numerous responsibilities, has been forced to resign the editorship of The Auk, and the Council of the American Ornithologists' Union, at the recent meeting in Philadelphia, chose Mr. Witmer Stone as his successor. Simultaneous with Dr. Allen's retirement Mr. Frank M. Chapman resigned as Associate Editor.

Beginning with the initial volume of the Bulletin of the Nuttall Ornithological Club, and continuing to the present year, Dr. Allen has, without intermission guided the course of this journal and its successor The Auk; and the series of thirty-six volumes stands as a perpetual monument to his ability, and his painstaking devotion to the cause of ornithology and the interests of the American Ornithologists' Union. There have been few continuous editorships of equal length in the history of scientific periodicals.

Dr. Allen has kindly agreed to see the present number, already partly under way, through the press, but hereafter all articles and communications intended for publication and all books and publications for notice should be sent to Mr. Witmer Stone, Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

The rapid decrease in the number of bird collectors is a matter that has attracted the serious attention of ornithologists in the past few years. It is certainly true that there are to-day, very few young men engaged in forming a collection of bird-skins, formerly regarded as a *sine qua non* to the development of an ornithologist. So serious has this matter appeared to some, that it has been suggested that the A. O. U. Committee on the Protection of North American Birds might well be changed to a Committee for prevention of the extermination of North American ornithologists. The abandonment of collecting is charged to the stringency of the State laws, some of which make the acquirement of a collecting permit impossible, while others impose such limitations as to make it useless for scientific purposes. The Audubon Societies have been blamed for this condition of affairs, but we believe wrongly. In practically all of the bills endorsed by the Audubon Societies proper provision is made for scientific collecting, but the legislative committees and State game commissions, without adequate knowledge of the needs of ornithology, have frequently altered the bills, or so administered the laws, as to make the procuring of a permit difficult or impossible.

On the other hand it often happens that among those who have secured permits in the past there are some who have displayed little or no sympathy with citizens who prefer live birds to dead ones, and armed with their permits they have carried on collecting close to houses and grounds in a manner which has made them very obnoxious. These men are naturally

regarded as examples of 'scientific ornithologists' and it is no wonder that they arouse opposition to the granting of any collecting license.

We believe that legitimate collecting is indispensable to ornithological research, and that such collecting in the past has had a negligible influence upon the abundance of our birds. Therefore it seems that the A. O. U. Protection Committee would confer a great benefit upon ornithology if it undertakes, as suggested at the recent meeting of the Union, to place the needs of ornithological collecting in its true light before the State game commissions and similar bodies; and also to bring all collectors to a full realization of the responsibility which rests upon them of prosecuting their collecting in a manner that will not prove obnoxious to their fellow citizens, and arouse antagonism against ornithologists at large.

There is still another side to this discussion. Perhaps, after all, the stringency of the laws is not the only, or even the main reason, for the decrease in the number of collectors. Many of the younger zoölogists in the eastern United States started in their scientific work as ornithologists and as collectors of skins, but later abandoned birds for some other group of animals; not because of difficulty in collecting birds but because they found better opportunities in other fields for original discoveries in local systematic work. There is a limit to the number of species and subspecies worth describing in any area, and so far as the study of the birds of eastern North America is concerned, that limit has practically been reached.

But systematic ornithology is after all only a branch of systematic zoölogy, and Ornithology in its truer and broader sense, has to do with Anatomy, Animal Behavior, Development and Meaning of Coloration, and other broad problems of evolution, just as much as with systematic work. In many of these fields birds furnish exceptional opportunities for the investigator, and moreover the collecting of skins in connection with such work is by no means a necessity, while the investigator is just as much an ornithologist as is he who concerns himself wholly with the study of specific and subspecific differences.

So, even while we maintain that collecting birds is still a necessary part of ornithological science in many parts of the world, and will always be so in anatomical and certain other lines of investigation, nevertheless wherever the systematic side of ornithology becomes practically a completed study, we must naturally expect to find a decrease in collectors, and this without danger of ornithologists becoming extinct.

As in previous years, the Museum of Vertebrate Zoölogy of the University of California was active during the past spring and summer in carrying on zoölogical field work. This year the work was conducted entirely within the State of California, in accordance with the principle that a knowledge of the native fauna is of first importance to a State institution of this kind.

The three months from March to May, inclusive, were occupied in exploration of the San Joaquin Valley along its entire length, the particular

purpose being to ascertain the status of the rodent population of the region. Incidentally specimens of certain desirable birds were secured, and much information relative to local bird distribution was obtained. This work was prosecuted by Mr. Swarth and Mr. Grinnell, with two assistants.

Miss Annie M. Alexander and Miss Louise Kellogg with two assistants spent the three summer months in the high mountain region of Siskiyou and Trinity Counties, collecting birds and mammals, in continuance of work begun by them during the previous winter. The series of specimens gathered includes several species new to the Museum, one bird being new to the known fauna of the State, while much information bearing upon the relationships of the Shasta and coast faunas was obtained.

The period from June 15 to September 15 was occupied in exploration of the mountainous region lying between Tehachapi Pass and Mount Whitney. Mr. Grinnell, Mr. Taylor, and three assistants were engaged in this work, the results comprising, aside from large series of specimens of mammals, birds, and reptiles, an increased knowledge of the complex faunal conditions at the southern end of the Sierra Nevada.

All of the above field work was made possible through special gifts by Miss Alexander of funds for its support.

Mr. Samuel N. Rhoads returned from Ecuador early in August after a very successful trip of about six months. He collected at various points along the railroad which runs from Guayaquil to Quito, especially at Bucay (975 ft.), on the Chanchan River (2000 ft.), Huigra (4000 ft.), Mt. Pichincha (8000 ft.), Riobamba (10,000 ft.), and in the vicinity of Quito. He brought back about 1600 birds, some mammals and reptiles, and a number of invertebrates. His collection is now at the Academy of Natural Sciences, Philadelphia.

Mr. Roy C. Andrews, Assistant Curator of Mammalogy in the American Museum of Natural History, sailed for Korea, December 13. He expects to spend about two months at the whaling stations there, for the purpose of studying and securing specimens of the California Gray Whale, and Humpbacked Whale. He then plans a trip into the mountains of northern Korea, known as Chokaku San, where about four months will be spent in collecting mammals and birds, if possible in regions not hitherto visited by zoölogists.

Mr. Alex. Wetmore will represent the Biological Survey, U. S. Department of Agriculture, in Porto Rico this winter, coöperating with the Insular Board of Agriculture in studying the economic relations of the birds and mammals of the island.

Mr. E. A. Goldman of the Biological Survey will return to Panama about January 1, 1912, to resume his investigations of the birds and mammals of the region.

PART V of Ridgway's 'Birds of North and Middle America' appeared on November 29. Part VI we learn is well under way and partly in type. The whole will now probably run into nine volumes instead of eight as originally estimated.

DR. EDGAR A. MEARNS sailed on October 28 for London to join Mr. Childs Frick on an expedition to Abyssinia and Lake Rudolf. The members of the expedition will include, besides Dr. Mearns, Mr. Childs Frick, son of Mr. Henry C. Frick of Pittsburgh; Mr. Blick, a friend of Mr. C. Frick, and a physician. The country it is planned to explore will be primarily Abyssinia, but the trip will be extended into British East Africa, and include the region about Lake Rudolf. It is intended to make as complete a collection as possible of the mammals and birds of the regions visited, Dr. Mearns giving his attention to the birds and small mammals, which will go to the National Museum. The country it is proposed to traverse will be mainly outside of that visited by the Roosevelt expedition, thus enabling Dr. Mearns to become personally familiar with areas having an important relation to the faunas he has already studied in other parts of Africa. The new material thus obtained will supplement in an important way that already acquired from the African region by the National Museum, and be of great importance in working out the collections gathered by the Roosevelt expedition. As both Messrs. Frick and Blick, as well as Dr. Mearns, have had previous experience in African wilds, important results may be expected from their present extended expedition.

WITHERBY AND COMPANY, London, announce the early publication of 'A History of the Birds of Colorado' by William Lutley Sclater, lately director of the Colorado College Museum. The volume is to consist of 500 pages and 16 full-page plates from photographs, and the edition will be limited to 550 copies. Subscription price for the United States, $5.

The prospectus states that the avifauna of the State has never been hitherto adequately dealt with, and in the present volume an attempt has been made to give (1) Short descriptions and keys of all the birds, some 392 in number, hitherto recorded from the State. (2) An account of the distribution of each bird without and within the State. (3) A short notice of its habits, and (4) A list of references to its occurrence in the bird literature of Colorado.

American ornithologists will look forward with much interest to the appearance of Mr. Sclater's volume.

BIRD-LORE for December closes the thirteenth volume of this magazine, which contains almost twice as many pages as Volume I. This increase in size is, in part, due to the natural growth of the magazine, and in part to the publication in it of the Annual Report of the National Association of Audubon Societies, which occupies about one half of the present issue.

This report includes an outline of the work of the Secretary for the past year, under the heads of 'Legislation,' 'Field Agents and other Workers,' 'State Societies,' 'Bird Colonies,' 'Wardens,' 'Egret Protection,' the 'Mrs. Russel Sage Fund,' 'Miscellaneous,' and 'Financial.' The report of the Secretary, Mr. T. G. Pearson, is followed by reports from field agents in New England, on the Pacific coast, in Texas, in Virginia, and from various bird colonies. Added to this are reports from the thirty-eight State societies which form, as it were, State agencies for the National Association, and which can deal with local issues far more effectively than could a national organization not familiar with local conditions.

The report of the Treasurer, Dr. J. Dwight, Jr., shows that the income of the Society for the year ending October 20, 1911, was $36,599.72, of which no less than $10,000 was made up of special contributions, and it is hoped that as the increasingly important work of the Association, with its State allies, becomes more widely known, it will receive even greater financial support from the public. The report in question is one of the best arguments which the Association could put forth as an appeal for funds with which to carry on its work, the limits of which are governed only by its means. The past history of the whole movement for bird protection has been one constant struggle to secure, retain, and enforce proper legislative measures designed to protect birds. Up to the present time the efforts of the Audubon Societies have of necessity been so largely directed toward this end that they could not devote due attention to the educational aspects of their work. In the future, however, let us hope that public sentiment has become so thoroughly aroused that there will be less danger of the repeal of the excellent laws which, generally speaking, prevail throughout the Union, and that in consequence the National Association may devote a greater part of its time and income to the diffusion of knowledge of the economic and æsthetic value of birds.